Report of
The Maryland Agricultural Society—
Maryland Farm Bureau Federation,

INCLUDING REPORTS OF THE

Maryland State Horticultural Society,
Maryland Crop Improvement Association,
Maryland State Beekeepers' Association,
Maryland Vegetable Growers' Association,
Maryland Stockmen's Association,
Maryland Poultrymen's Association,
Maryland Tobacco Growers' Association,
Home and Community Committee Meeting,
4-H Club Conference,
Roadside Marketing Conference

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REPORT OF THE

MARYLAND AGRICULTURAL SOCIETY

THE

MARYLAND FARM BUREAU FEDERATION

INCLUDING THE REPORTS OF

The Maryland State Horticultural Society
The Maryland Crop Improvement Association
The Maryland State Beekeepers' Association
The Maryland Vegetable Growers' Association
The Maryland Stockmen's Association
The Maryland Poultrymen's Association
The Maryland Tobacco Growers' Association
Home and Community Committee Meeting
4-H Club Conference
Roadside Marketing Conference

VOLUME XVII, FOR THE YEAR 1932

LIBRARY, UNIVERSITY OF MARYLAND

PUBLISHED BY THE SOCIETY, MARCH 15, 1933
EDITED BY M. H. FAIRBANK AND T. B. SYMONS,
BALTIMORE, MD.

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vol. 17

LETTER OF TRANSMITTAL

To His Excellency, Albert C. Ritchie,
Governor of Maryland.

SIR:

I herewith submit to you as directed by the Act incorporating the Maryland Agricultural Society, and also the Horticultural Society, this report for the year 1932, which contains a detailed statement of the receipts and expenditures of the Society as approved by the Executive Committee and Advisory Council. It contains the proceedings of the Seventeenth Annual Meeting of the Maryland Agricultural Society, Maryland Farm Bureau Federation, and annual meetings of the Affiliated Associations.

I trust that an inspection of its contents will convince you that the funds appropriated for this purpose have been wisely and judiciously expended.

Respectfully submitted,

MILES H. FAIRBANK,
Secretary.

March, 1933,
Baltimore, Md.

THE MARYLAND AGRICULTURAL SOCIETY
THE MARYLAND FARM BUREAU FEDERATION

Sherwood Building
Baltimore, Md.

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REPORT

OF THE

Seventeenth Annual Meeting

OF THE

Maryland Agricultural Society
Maryland Farm Bureau Federation

January 4-5-6, 1933

Lord Baltimore Hotel

Baltimore, Md.

WEDNESDAY AFTERNOON

January 4, 1933

The First Session of the Seventeenth Annual Meeting of the Maryland Agricultural Society, The Maryland Farm Bureau Federation, held in the Ballroom of the Lord Baltimore Hotel, Baltimore, Maryland, convened at one-fifty o'clock, Mr. E. Thomas Massey, president, presiding.

PRESIDENT E. THOMAS MASSEY: The meeting will come to order. It gives me pleasure to announce your presiding officer this afternoon. He comes from Washington County. We call him Roy. It gives me great pleasure to present him to you as your presiding officer this afternoon. Mr. Weagley.

Mr. Weagley assumed the chair.

CHAIRMAN WEAGLEY: Mr. President, Guests, Ladies and Gentlemen: I don't know as I can say it is a pleasure to me to be able to preside this afternoon, but it is an honor. For I feel sure as we hold our convention this week we will be more closely watched than ever before, knowing

that some of the suggestions brought out by the State Farm Bureau and the State Grange have caused lots of discussion all over the State. I note from a newspaper clipping sent me a few days ago by our secretary that the Farm Bureau folks are supposed to be singing a new song. The clipping states: "It is a hitherto unheard song that the gentlemen of the Farm Bureau and State Grange are singing. We like the words and music." I might add that we like the contact and the fellowship that we have had with our city friends, and it is with pleasure that I present to you at this time no stranger, but the Hon. Howard W. Jackson, Mayor of Baltimore, who will welcome us to Baltimore.

HON. HOWARD W. JACKSON: Mr. Chairman, Ladies and Gentlemen: I am very pleased to have the opportunity of welcoming you to Baltimore, the delegates of this meeting, of the two most important agricultural groups in Maryland.

I didn't particularly come to say much to you about Baltimore. I prepared a little address and I am going to ask your indulgence while I read to you what I have to say. Your chairman has said you probably attract more attention than usual, that your deliberations here will be given more serious consideration than has probably been the case in the past, because we are all bound up with the same problems at this time. In other words, I believe it is right that the metropolis of the State—and we are peculiar here in Maryland, not saying anything about Frederick, or Hagerstown, or Cumberland, but we only have one metropolis. New York State has its Buffalo, Syracuse, Binghamton, Greater New York, Brooklyn, and other cities. Pennsylvania has its Chester, Pittsburgh, Philadelphia, and larger centers, but here in Maryland one-half the population is in the metropolis of the State, Baltimore. Therefore, we are really more one city and counties than is the case in other States. Therefore, your problems are our problems, and our problems are yours. You are interested in our problems, and we in yours. Your interest is our interest, and our interest is yours.

I believe it is right that the metropolis of this State, Baltimore, should have made and should continue to make its contribution to the State as a whole. Yet, we find ourselves faced with economic difficulties in times of distress over which we have no control as individuals or as a community, and we must meet our problems with a united front.

I am glad I can come here today feeling there is a better understanding between the people of the counties and the people of Baltimore than ever before in the history of this city and State. To meet our problems we have gone a long way. We could spend this year, making the first appropriation after the middle of April for emergency relief, more than three and a half million dollars last year, and running as high as $10,000 a week, starting off last April with $40,000. We are housing the houseless, clothing the naked, feeding the hungry. That problem will be met, and I am glad Governor Ritchie has taken a stand favorable to it in his message delivered to the Legislature today.

In addition to that, we have very materially reduced the cost of government in Baltimore in the last few years. When I returned to City Hall May 19, 1931, it was a time and in a year when the budget of Baltimore was the largest in its history, at a time when the taxable basis of Baltimore was the largest in its history, but our taxable basis went off $98,000,000 in 1932 and $238,000,000—a total of this amount—in two years, reduction in our taxable basis. We have reduced the operating cost of government in Baltimore in two years, $7,941,000. True, our tax rate this year is 20 cents higher than it was in 1932, but there are 39,811 taxpayers in Baltimore this year who on account of the reduction in their assessment find their bill in the lower right hand corner will be less than when they paid their taxes in 1932.

Of course, I could go into great detail, but I don't feel I am called upon to do it, don't feel I should impose upon

you and your time to the extent it would take me. Suffice it to say, we are trying to meet our problems as you are trying to meet yours.

In this room are gathered not only the leaders of the farm producing element of Maryland, but men and women who hold high places in both the local communities and in the State as a whole. Your meeting assumes wide significance in the fact that you will undoubtedly discuss a program of vital interest to both counties in the State and larger urban centers such as Baltimore, Cumberland, Hagerstown and other cities and towns. The general business depression has laid a heavy hand upon all our people, raising problems of government and of taxation in particular, that in principle are more drastic and far-reaching in the business and to the homes than has been the case at least within this generation. If there ever was a time for men and women of leisure, the present is such a period. At such a time as this it is only too easy to join some movement which lifts the banner of so-called economy. It is but a natural trend that in times when the emotions of men are deeply disturbed by financial stress to demand programs of so-called reform and of relief that in the end may have a damaging reaction far beyond any element of gain. The will of the people must prevail in the final analysis, but the will of the people should be thoroughly understood, and the people should have thorough understanding of both cause and effect in any vital change of governmental or administrative policies.

Men have long since learned the methods and power of mob psychology. During the great World War this was spoken of as propaganda. We hear much these days of technocracy, or the replacement of the human element in employment by machine. In the present readjustment of the governmental relations that is sweeping the country we might also give the name homeocracy for concentration of human desires as a whole or application of programs as fixed by relatively such groups. This situation of a public

will to attain a particular program has a possibility of much good in the direction of the intelligent thought of the people if it is constructive, but it has the power for much evil if it is born of special interest and fostered by special and selfish purposes.

I have long been deeply impressed with the knowledge that Baltimore, the metropolis of our State, and various counties of our State are so interdependent in their business and social relations, one cannot prosper without the other being prosperous, any more than one can suffer reverses without the other feeling the same effects. I believe a happy condition exists at present in that the people of Baltimore as a whole have better understanding of the counties of the State than ever before existed, and, on the other hand, people of the counties at this time have a more thorough knowledge of the people of our cities than they had in former years. The press of Baltimore and that of the counties of Maryland has done much to spread knowledge along this line, while the radio, the telephone, and the automobile have brought all of the people into closer contact and into more sympathetic understanding than existed a decade ago.

I mention these facts because I feel that they have a distinct bearing upon that part of your deliberation which may include the formulation of suggestions or requests for legislative action. I cannot see any reason why the City of Baltimore and the agricultural interests of Maryland should not be in accord on vital matters of legislation which may come before the General Assembly. There is not sufficient time in this address to discuss details of what Baltimore and the counties may desire to meet the conditions and better conditions of their people. I want to assure you, I stand ready at all times to discuss with your representatives and with any other representatives of agriculture in Maryland any problem in which the city may aid the agricultural districts of the State, or in which the city may ask the co-operation of the people of the counties. In your

deliberations you will discuss many things of great importance to farmers, such as co-operative marketing, milk production, and general marketing activity.

I was born in the country and spent my early days in contacts which gave me some appreciation of agricultural problems and needs, and I can assure you that I have the most hearty sympathy with the move to better conditions of the agricultural interests of Maryland, which, after all, are the backbone of our community life. I believe you will agree with me when I say that in the approach to the solution of our problems, whether they be of the city, the town, or the farm, that they should be approached with understanding and with regard for the rights of all. We cannot travel far by trampling on the rights of others. We must join hands and move together for a common purpose. Much can be accomplished if all of us will pursue that course. I welcome each and every one of you to Baltimore City, although this is not really necessary, for, after all, every true Marylander has the interest of the metropolis at heart, and is a Baltimorean in spirit. Your deliberations are important to agriculture, and they are important to Baltimore. May wise Providence guide your minds and your hearts and God bless you with prosperity.

CHAIRMAN WEAGLEY: Mayor Jackson, on behalf of the Maryland Farm Bureau, I wish to say that we appreciate your hearty welcome. In the past number of years we have always held our conventions here in your city, and they have left a pleasant taste each time.

It is our desire, Mr. Mayor, that by trying to help ourselves we may all come out of this unpleasant situation together, and may I extend to you, Honorable Mayor, a New Year's wish. May you in your days of retirement look back to the year 1933 as one of your most successful years as Mayor of Baltimore. And may the Farm Bureau be able to make this a reality.

The next item on the program is the annual address of

our President. He needs no introduction to you. He comes to us with long experience as Vice-President of our organization. You all know him, and it is with pleasure that I present to you at this time Mr. E. Thomas Massey, president of the Maryland Farm Bureau Federation. President Massey comes from a section which I know all the folks there are proud of, the Eastern Shore. President Massey.

PRESIDENT'S ANNUAL ADDRESS

By E. T. MASSEY,

Massey, Maryland.

Mr. Chairman, Fellow Farm Bureau Members, Ladies and Gentlemen:

My duty here today is both a pleasant and a sad one. As one who has and will always believe in co-operation and who feels it a privilege to have been a member of the Farm Bureau since it was organized in Kent County ten years ago, I am happy to present to you an account of our stewardship of the past year, yet, when I look at that empty chair, I feel that I am but substituting for one who should be here in my stead. My consolation is that it is an honor to call your attention to that work, in which our late president, "Jim" Davis, was so sincerely interested.

I have only been charged with the responsibilities of this office since his death on October 9, but as a director of the Maryland Farm Bureau Federation for the past ten years and as your vice-president since 1926, it has been a source of no little pride to see this organization grow in wisdom and influence, until today it represents the dominant factor in agricultural leadership in our State.

The first severe blow, felt by the Maryland Farm Bureau during the past year, was the death of our secretary-treasurer, Frank M. Payne, on April 7. Truly it can be said

that he died in harness, since it is without question that his untiring efforts and his willingness to make any personal sacrifice to carry on the job in which he was engaged, brought on the fatal illness from which he was unable to escape.

For a while we were at a loss to find someone to take his place, although we realized that amongst our leadership were many capable men. Your directors selected Miles H. Fairbank who had done organization and publicity work for the Farm Bureau in 1924 and 1925, pursuant to which he had been County Agricultural Agent in Howard County. While he came to us from Indiana, he is a Marylander by birth and I am sure we have made no mistake in bringing him back to his native State for this important work.

Maryland farmers, even amidst their distress can consider themselves fortunate, when we compare our conditions with those of the rest of the nation. We have seen our incomes dwindle away; we have been forced to a most drastic reduction in our expenditure and, in the improvement of our farms. But there have been no wholesale foreclosures or evictions among the farmers of Maryland. We still have our courage, most of us are eating regularly, if not in abundance, and we are hopeful of better times to come.

It has seemed to your Farm Bureau leaders that the biggest problem facing the farmers of Maryland was to reduce their fixed charges during this period of rehabilitation. Important among these items is that of our tax burden.

More will be said during the convention regarding our program of tax relief, but I can not refrain from calling to your attention the prestige that the Farm Bureau has enjoyed during this campaign and the influence it has wielded in molding public sentiment along constructive and unified channels of thought.

Maryland can take pride in the fact that the president of your Farm Bureau has been privileged to sit on the Board

of the American Farm Bureau Federation as a director. Our first president, Mr. E. P. Cohill, was accorded that honor and when his place was taken by Mr. Davis he, too, was elected to the National Board. It was an honor, accompanied by a responsibility that I fully recognize, that I was elected to fill our late president's place on the Board of the American Farm Bureau Federation at the recent convention in Chicago last month.

It is extremely unfortunate that more of our farmers could not have attended the Chicago meeting. I am sure if our rural people could see the character of men and women who assemble from all parts of the nation, the thought and study that is being put into our bigger agricultural problems, the manner in which antagonism and opposition are being analyzed and met, they would go forth to their labors with renewed hope and the conviction that the prosperity of American agriculture lies in holding and maintaining a bigger and more active Farm Bureau organization.

To those of us who have been on the firing line of Farm Bureau, it has ofttimes seemed as though progress has been slow and complicated. Yet we realize that farming, as a business, moves over long periods and changes must of necessity take more time than in other industries. While the Farm Bureau has been organized in Maryland for ten years and we believe has, during that time, saved our farmers many times the amount of money they have invested, yet, we are beginning today to realize the culmination of many of the big things that we set out to accomplish several years ago.

We have seen in the past year the development of our automobile insurance business to a point where it is a genuine contribution, both to the maintenance of the Farm Bureau and a money saving service to farmers; we have seen our wool marketing organization brought to a point of real effectiveness; we have seen the organization of a

regional live stock marketing organization operating on the Baltimore terminal market; we have witnessed, most important of all, a respect for the judgment and leadership of the Farm Bureau that encourages us to believe that progress will be less difficult in the future.

From a national standpoint the Maryland Farm Bureau has been able to wield a quiet, yet potent influence. Because of our proximity to Washington and our representation on the National Board, your officers have attended many hearings and taken part in many conferences, all in the interest of agriculture. Unfortunately, much of this effort is unknown to our farmers, yet there is no question regarding the importance and value of this effort.

I wish to call your attention to Resolution No. 1 adopted at the last National Farm Bureau Convention on sound and honest money, advocating reduction of gold in the dollar from 23.22 to 16 grains; if enacted into law, we believe it would start us on the road to recovery by increasing commodity prices.

Let me repeat that we are, by no means, unmindful of the problems that confront us. We have a long way to go before agriculture is back where it belongs and when we can have that security we feel is so necessary. Yet we realize that, only by organization, can we do the things that need to be done and I call on every loyal member to dedicate himself or herself to a further building of the Farm Bureau in Maryland.

CHAIRMAN WEAGLEY: The Farm Bureau had a sudden change in secretaries this year. When we changed from Mr. Stewart to Mr. Payne it was not so sudden. Mr. Stewart was here to hand over the stick to Mr. Payne. Mr. Payne went along and dropped the stick. Along came our present secretary, tried the stick, picked it up, and is running a successful race. I am sure he needs no introduction to you. He is a Marylander, born down on the Eastern Shore. He

studied to be an engineer, changed his mind and became a county agent, helped to organize the first Farm Bureau in Howard County, and took over the office of Secretary of the Farm Bureau May 1, 1932. It is with pleasure that I present Miles H. Fairbank, our secretary, to you at this time.

ANNUAL REPORT OF SECRETARY-TREASURER MARYLAND FARM BUREAU FEDERATION FOR 1932

MILES H. FAIRBANK.

Mr. Chairman, Ladies and Gentlemen: It becomes necessary, as secretary-treasurer of the Maryland Farm Bureau Federation, for me on this our tenth anniversary to present to you a resumé of the activities of your organization for the past year, and a summary of those plans that will project our activities into the coming months.

It is fitting, at this point, that I should call your attention to several phases of our background that are influencing our present activities. While this is the Seventeenth Annual Farmers' Week, sponsored by the Maryland Agricultural Society, ten years ago the Maryland Farm Bureau Federation came into being as a result of the deliberations of the agricultural leaders of this State who recommended, at that time, the setting up of a federation of agricultural thought, properly financed, through which the interests of the farmers of this State could not only be safe-guarded and fostered, but through which they could take their part in co-operation with similar groups from other States in solving the major agricultural problems affecting the nation.

Two good men have served in the past as secretary-treasurer of this organization. Coming into your midst only recently, charged with the responsibility of the details of the Federation, I should be remiss in this my first report if I did not express my appreciation of the splendid work

that has been done by my predecessors. M. Melvin Stewart assumed the duty of secretary-treasurer at the time when it was necessary to have someone qualified to work out the detail policies of administration, organization set-up and to assemble the machinery with which to accomplish those things that this organization was destined to do. The fact that we have made so few changes in our financial relationships with the counties, in our method of co-ordinating membership control and in our policy of co-ordinating the activities of our affiliated organizations, is sufficient evidence of his ability and sincerity along these lines. Following Mr. Stewart, you selected a man, Frank M. Payne, who was eminently qualified to carry out the program of work that had been charted, which is, at all times, the second phase of any organized effort. The sad circumstances that made it necessary for you to seek another secretary will not be soon forgotten. Mr. Payne had demonstrated the type of leadership that was needed, and when the Grim Reaper took him from your midst, I am assuming that you believed that I possessed, in a small degree, some of these same qualities you had learned to admire, and for that reason, entrusted me with the responsibility of carrying on. Believing that, it has been my determination, upon assuming these duties last May 1st, to attempt no innovations or radical changes in our organization and administrative picture, but simply to attempt to carry out and complete that which had already been started.

It has been a delightful but, at the same time, a strenuous task of renewing acquaintances, making the necessary new contacts and acquainting oneself with the details of the new developments that have taken place in the past several years. It was most encouraging to find the same co-operative spirit that we have always associated with Maryland farm organizations and the same enthusiastic leadership.

I must mention here the second blow that fell upon our organization this year when on October 9th, President James W. Davis was suddenly stricken, while in New York

on Farm Bureau business. To say that his death was a severe loss is a most inadequate expression. To your secretary, who had depended so much upon his mature judgment and calm assurance, it left a void that will not soon be filled. Your vice-president, E. Thomas Massey, was authorized to assume the duties of president and has been most active in filling that office during the past several months.

It is customary to say that the Farm Bureau has been active, but we believe a study of our activities will substantiate that statement. Co-operative marketing has, of course, always occupied a prominent place in the Farm Bureau program. It has been our privilege, during the past year, to work very closely with the United Wool Growers' Association, with which we are, as you know, affiliated through the Maryland Farm Bureau Wool Pool, Inc. Delays, over which we had no control, were responsible for some disappointment in the time of return to those farmers who pooled their wool last year, and a final settlement of from ¼ to 1 cent a pound, depending upon grade, was made to all farmers over and above that which was advanced them in 1931. Undoubtedly this was largely responsible for the reduced tonnage this year. Thirty-five thousand three hundred ninety-four pounds of wool was Maryland's share of the wool pooled by the United for 1932, on which 8 cents, for the most part, and later 7 cents per pound, was advanced to the growers. I am happy to report to you that we have been advised that this entire wool has been sold at an average of 17 cents, on which the cost of selling was approximately 6 cents a pound, and settlement will be made at an early date.

Nothing has been more encouraging during the past year than the splendid results that have accrued from the participation of the Maryland Farm Bureau Federation in the organization of the Eastern Livestock Co-operative Marketing Association. While seven States have all done their full share in the promotion of this most successful marketing organization, Maryland has had an opportunity because

of our location, organization, and facilities of assuming a position that has been denied the other States. The manner in which our State met its obligation in this enterprise and the dispatch with which we completed our financial support, is splendid evidence of the value of organization among farmers.

In the original set-up, Maryland was asked to sell or subscribe $4,000.00 in stock to the Eastern. We incorporated the Maryland Farm Bureau Livestock Marketing Association and alloted to the several counties a pro-rata amount of stock to be sold. Already several counties have sold and paid in more than their allotment but, in order to facilitate the early operations of the Eastern, the Maryland Farm Bureau Federation advanced $2,629.00; this being the difference between the stock actually sold and $4,000.00. For this we hold the note of the Maryland Farm Bureau Livestock Marketing Association, drawing interest and to be reduced as additional stock is sold within the State.

The Eastern has been extremely fortunate in securing as manager, Mr. L. T. Skeffington, formerly of Indiana, who, with a background of Farm Bureau and co-operative experience, as well as being a splendid fellow personally, has made himself a host of friends among our farmers and members.

Mr. J. W. Jones, our Montgomery County Farm Bureau president, has served as secretary-treasurer of the Eastern since its organization and it has been my pleasure to have assisted him in the handling of a few details incident to that office. I have also had the privilege of sitting in, in an advisory capacity, on all meetings of the board and executive committee of the Eastern.

Shortly after assuming office, it became apparent that the biggest single opportunity for service to the farmers of Maryland was presented in the tax problem. Scattered efforts had been made throughout the State along the lines of tax relief. The Governor had appointed a Tax Survey Com-

mission to study this question; in various counties, committees, some of them led by the county Farm Bureau, and others by different leadership, sprang up to advocate a general program of tax reduction. These efforts lacked co-ordination; much of the agitation was based on local opinion or stressed by local circumstances and, in many instances, without definite direction.

The Maryland State Grange had, however, given considerable study to the rural tax situation for several years and had incorporated their recommendations in the fifty-ninth annual report of that organization. On June 15, the Farm Bureau tax committee invited the Grange tax committee, headed by Mr. D. G. Harry, to sit in on a joint conference where, after careful consideration, a program was adopted as the tax relief program of the farmers' organizations of Maryland.

So much has been said regarding the details of what we propose as affording relief to the property owners, and more will be reported by the tax committee tomorrow, that it is superfluous to dwell on details in this report. It is sufficient to relate that it has been our privilege to present this program to the Tax Survey Commission, the associated groups of county commisioners and others. We have traveled from one end of the State to the other and discussed it in nearly all counties as well as before civic groups. We believe we can claim credit for having pointed the way to a definite goal and to have crystalized sentiment along unified and constructive lines.

Most important, if the proposed program is carried out, it will result in a very substantial reduction in our local tax rate, approximately a saving of over $4,000,000 annually in taxes on real estate.

While the tax program has necessarily consumed most of our time and attention, we have endeavored to be on the alert to utilize the collective force of our organization wherever an opportunity presented itself to be of service to Maryland farmers.

Along these lines we have co-operated with the Wholesale Fruit and Produce Exchange of Baltimore in the creation of a city ordinance that would impose a license of $100.00 on itinerant truckers. This ordinance, in the opinion of our leaders, will react to the benefit of our Maryland farmers which it exempts, in aiding in the preservation of our local market, now overloaded with out-of-State produce, trucked in from great distances. We have met with the produce dealers and commission men in the discussion of this proposed ordinance and appeared before the Legislative Committee of the Baltimore City Council in its behalf. As yet, the ordinance has not passed, being still in committee, but we shall give it our active support until enacted into law.

During recent months, we have seen the establishment of one of the Regional Agricultural Credit Corporations set up in Baltimore by the Reconstruction Finance Corporation under the authority of the Emergency Relief Act. Mr. Charles Rieman, president of the Western National Bank and a true friend of agriculture, was appointed president, and Mr. L. A. Wingo, cashier of the Petersburg National Bank of Petersburg, Virginia, was appointed vice-president and general manager. Your organization was recognized in the appointment of the Board of Directors and has also been appointed on the Executive Committee and the Loan Committee. This organization has hardly gotten under way, and it is too early to see what actual benefit it will be to our farmers. This much can be said, however; we have $3,000,000 available to loan in the five States covered by our district, and an interest rate of 5½ per cent. It is highly probably that this may be a real service where credit is actually needed.

The death of President Davis left, of course, the Agricultural Corporation without its managing head and it is, indeed, fortunate that we have had as vice-president of that organization, Senator Abram G. Ensor who, in addition to being Master of the Maryland State Grange, has always been one of our most active and dependable Farm Bureau leaders.

The Agricultural Corporation has had its difficulties, as

would be expected in times through which we have been passing. Keen competition among commercial feed dealers, a curtailment of dairy feed consumption, an almost chaotic condition in the fertilizer industry, and a scarcity of money among our best customers and members had made the management of that organization extremely difficult.

Senator Ensor was placed in control by the Executive Committee of the Corporation, following Mr. Davis' death and even in these few weeks has made significant progress in solving several of the most pressing problems. Recently your Board of Directors appointed a committee, and the Agricultural Corporation did likewise, to draw up recommendations for reorganizing the Agricultural Corporation so as to make it capable of rendering greater service to the farmers of Maryland. This committee met two weeks ago and the recommendations adopted will be submitted to the respective boards tomorrow. We are hopeful that, during the coming months, we can so develop the Agricultural Corporation so as to make it a dominant factor in the business activities of our farmers.

I am happy to report a most successful year for the Farm Bureau Mutual Automobile Insurance Company under the leadership of our capable State Agent R. W. Richert. We now have in Maryland over 8,800 policyholders as against 6,000 at the end of 1931. Mr. Richert has over 100 agents, each one an enthusiastic Farm Bureau booster and here we feel we have rendered and are rendering the farmers of Maryland a distinct service. A problem, that confronts us is the rapid increase in our claims. While an increasing number of policyholders makes an increase in claims inevitable, it must be remembered that in a mutual company losses are a big factor in fixing rates. Some campaign must be conducted during the coming year to attempt at least to reduce the number of accidents among our policyholders.

Maintaining membership is, of course, always of prime concern within the Farm Bureau. Many loyal members have this past year fallen by the way, not in spirit or belief

in organization, but simply because of economic stress. Money has been extremely scarce, out on our farms, and there have been many places to put any $10.00 bill available. Thus the Farm Bureau has suffered. It is safe to say that the Farm Bureau has more believers and fewer paid up members today than at any other time. This has made it necessary to restrict our budget in most counties and necessarily our activities.

With the State office we have, thanks to the revenue from the insurance office, been able, with strict economy, to not only live within our income, but add a little each month to our reserve. A full financial report will be handed each director and will be published in the annual report, but I may say that your State Farm Bureau is entirely free from debt and is gradually building up a small, but comfortable reserve.

We have, however, been deeply concerned over the financial condition of some of our county organizations. It is obvious that more members are needed, both from the moral support that comes from mere numbers, as well as the contribution to our financial well being. As a State organization, we have at all times, in publicity, legislation, conferences, and matter of service, tried to represent all the groups that go to make up our Federation, yet the financial support we receive from the affiliated organizations is negligible. It would seem that the leaders of our affiliated organizations could render a great service by urging all their members to become paid-up members of the Farm Bureau also. For sometime, we have debated the advisability of reduced membership dues. Finally, after conflicting opinions expressed at various meetings by our leaders, the directors voted on November 18 to submit to this convention an amendment to our constitution reducing the dues to $5.00. Obviously, if carried out, this is a courageous step. We are depending absolutely on the assumption that there are several thousand more farmers in Maryland who would like to support the organization that has only as its objec-

tive the benefits that can come to agriculture through co-operative effort, and this does not seem unreasonable.

This report would be incomplete if I did not pay tribute to the splendid co-operation which we have received from the University of Maryland and its staff. Dr. R. A. Pearson and Dr. T. B. Symons have been an important stabilizing force and yet, at the same time, an inspiration. We have sought their help and advice freely and have yet to be disappointed. The same is true of all other members of the faculty and the Extension Service; Mr. E. I. Oswald, County Agent leader, Miss Kellar and the entire staff of specialists, county agents and home demonstration agents have been an active part of the Farm Bureau movement all year.

Happy, indeed, is the State that enjoys the co-operative spirit that exists in Maryland. There is no antagonism to farmers or farm organization here. During the past months various civic organizations have apparently enjoyed having us take part in their programs and have, in many ways, tried to be genuinely helpful. Our Smith-Hughes agricultural teachers and their leader Mr. J. D. Blackwell, have at all times shown a most helpful attitude. Governor Ritchie and the Mayor of Baltimore City have on numerous occasions demonstrated not only their willingness but their sincere desire to co-operate. The press of both Baltimore and the counties has been most courteous and co-operative.

With this splendid setting, with the demonstrated worth of the Farm Bureau, with the intelligence of our Maryland farmers, and with the increasing conviction that through organization can agriculture best be restored to prosperity and thus assure that peaceful and satisfactory farm life we desire, we face the coming months with confidence that our greatest opportunity lies yet ahead and that together in a constructive, affirmative way we shall be able to overcome all obstacles.

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR PERIOD FROM JANUARY 1, 1932 TO DECEMBER 31, 1932.

RECEIPTS:		
County dues	$3,975.26	
Subscription to Co-Op	662.47	
A. F. B. F. dues	662.47	
Associated membership dues	180.00	
Farm Bureau organization expense refund	99.89	
Medals from Tobacco Growers Association	5.00	
Board of Directors expense refund	3.60	
Publicity income	1,056.58	
Auto Insurance Commission	3,726.77	
Auto insurance renewals	7,097.00	
Bonding expense refunds	85.90	
Timomium Fair expense refund	167.40	
Interest earned on bank balances	28.21	
Interest earned on Liberty bonds	85.00	
Rent, telephone and telegraph refund	1,731.34	
Traveling expense refund	483.41	
Annual meeting 1932 income	1,079.05	
Annual meeting 1933 income	19.00	
Office expense refund	158.02	
Note (Live Stock Association) paid on account	425.00	
Total income for period	$21,731.37	
Bank balance for January 1, 1932	3,364.94	
Available cash		$25,096.31
DISBURSEMENTS:		
Farm Bureau organization expense	$1,242.08	
Medals	76.11	
Board of Directors expense	966.20	
Publicity	1,107.73	
Salary—Secretary-Treasurer Payne	1,266.65	
Salary—Secretary-Treasurer Fairbank	2,000.00	
Salary—clerks	2,340.00	
Salary—publicity	360.00	
Salary—accountant	180.00	
A. F. B. F. dues	617.97	
Bonding expense	131.00	
Executive Committee expense	10.15	
Timomium Fair expense	292.11	
Rent—telephone and telegraph	2,718.63	
Traveling expense	1,374.49	
Annual meeting expense 1932	1,832.92	
Annual meeting expense 1933	61.32	
Office expense	1,112.61	
Auto expense	455.35	
Live stock expense	156.38	
Rockne automobile	625.00	
Federal Bank check tax	5.52	
Loan to Live Stock Association on note	2,629.00	
Total disbursements for period		$21,561.22
Bank balance December 31, 1932		$3,535.09

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR MONTH OF DECEMBER, 1932.

RECEIPTS:

County dues	$267.00	
A. F. B. F. dues	44.50	
Subscription to Co-operative	44.50	
Associated Membership dues	40.00	
Rent—telephone and telegraph refund	131.66	
Auto Insurance Commission	165.75	
Auto insurance renewals	716.00	
Traveling Expense refund	160.56	
Medals from Tobacco Growers Association	5.00	
Office expense refund	3.50	
Farm Bureau organization expense refund	35.55	
Publicity refund	7.25	
Interest on bank balance	6.80	
Annual meeting expense 1933	19.00	
Total income for month	$1,647.07	
Bank balance December 1, 1932	3,586.55	
Available cash		$5,233.62

DISBURSEMENTS:

Office salaries—secretary and treasurer	$250.00	
Office salaries—clerks	225.00	
Office salaries—publicity	30.00	
Office salaries—accountant	10.00	
Office expense	152.04	
Rent—telephone and telegraph	211.88	
Traveling expense	372.94	
Board of Directors' expense	88.60	
A. F. B. F. dues	90.00	
Auto expense	51.71	
Publicity	141.72	
Bonding expense	12.50	
Annual meeting expense 1933	61.32	
Federal Bank check tax	.82	
Total disbursements for month		1,698.53
Bank balance December 31, 1932		$3,535.09

STATEMENT OF ASSETS AS AT DECEMBER 31, 1932.

LIQUID:

Cash in Union Trust Co.	$3,535.09	
Cash in saving account	2,000.00	
Liberty Bonds	2,040.00	
Note (Live Stock Association)	2,204.00	
Accounts receivable	722.58	
Total liquid assets		$10,501.67

FIXED:			
Furniture and fixtures	$2,930.11		
Less depreciation reserve	1,930.11		
Net book value		$1,000.00	
Rockne automobile	$850.00		
Less depreciation reserve	340.00		
Net book value		510.00	
Total fixed assets			1,510.00
Total assets			$12.011.67

CHAIRMAN WEAGLEY: The Secretary will announce the personnel of the committees that have been appointed.

SECRETARY FAIRBANK: The committees are as follows:

RESOLUTIONS COMMITTEE

R. C. F. Weagley, chairman

Benjamin Rosenstock	Roy Brooks
William Holloway	Andrew Cohill
D. Kaulk Kemp	Edw. Warfield, Jr.

MEMBERSHIP COMMITTEE

J. K. Funk	E. I. Oswald
William Holloway	H. B. Shoemaker
Carroll Lowe	H. B. Derrick
T. S. Anderson	R. S. Brown
H. E. Holsinger	Stanley Day

AMENDMENT COMMITTEE

M. H. Fairbank, Chairman

J. W. Jones	H. H. Nuttle

CREDENTIALS COMMITTEE

Charles T. Cockey, Chairman

William Smith	S. B. McDowell

CHAIRMAN WEAGLEY: Next on our program we will have reports from some of the co-operative organizations that the Farm Bureau has helped in organizing. I am sure we all appreciate the help the Farm Bureau has given these organizations. First on the program is Mr. Gardiner, manager of the Maryland Tobacco Growers' Association.

MR. GEORGE I. GARDINER: Mr. Chairman, Ladies and Gentlemen: I do not believe that during the entire time of 300 years since the first New England settlers watched their crops and wondered what they would bring have the crops been so watched and agricultural commodities not only watched by the farmers, but by those depending on them as they have been in 1932. We all know the effects of the present depression, but I am not convinced that the farmer is any worse off, and, in fact, not as badly off as any other line of industry. I certainly am not convinced that such is the case. I am certainly prepared to say that the tobacco farmers of Southern Maryland, while, of course, they have suffered and joined in the ranks of the depression more or less, they certainly are not any worse off than those in any other line of industry. Of course, they have suffered to some extent. They have not gotten the same price for their commodity, but it has been more as far as we are concerned, for I think we have handled in Maryland this year the second commonest crop of tobacco that was ever raised in Maryland, especially during my fifteen years.

But I am prepared to render to our board of directors tomorrow at our annual meeting a report that will convince them that we have had the best year in the history of our industry. I am prepared to say that we have had the largest increase in membership of any year during the last five years. I am prepared to say that we have had the largest increase in receipts of tobacco that we have had in any one year. I am prepared to say our position of assets and liabilities are the most favorable they have been in the history of the organization, and last, but not least, we are

prepared to show that we have got more cash money in bank than we have ever had.

And I am prepared to say something that I think is more important than anything else, and that is, the depression has shown the farmer the real need of organization; because about 50 per cent of our people in Southern Maryland, and I think it is so throughout the State of Maryland and far beyond its confines, had to get a real hard blow, and right on the chin, before they were going to see the real benefits of what all of you people are trying to do for them as leaders in any co-operative organization of the great Farm Bureau of Maryland.

We face 1933 on the untrampled waters; we are looking to the sunrise, and not to the sunset. But those untrampled waters in 1933 are going to be as they have been in the last 36 months, uncharted seas. But if ever there was a time, as has been proven and demonstrated by the people now flocking into our organization, that you should be a member of the Maryland Farm Bureau Federation, of your own commodity organization, it matters not what it may be, selling or purchasing, or anything else, to minimize as much as possible the handicaps that you are yet bound to meet in this long tunnel of depression which we have passed through, I want to say if you are not a member, you should at once make the biggest official act of agriculture in 1933. For I do know that it has been clearly demonstrated to our people when I tell you of the results that we have obtained in our fifteen years of experience. I never saw the time when organization did them more good in passing over the troubled waters that we have had and that you have all had in 1932. And if your membership in the Maryland Farm Bureau Federation or in your own commodity organization is worth nothing else to you than to have a central body and organization that is so much needed to meet and combat with the many handicaps that you are to face, and has been clearly demonstrated to you, carrying

you over this troubled period, if it is worth nothing else, it is worth its weight in gold for that one purpose.

I am firmly of the opinion, and I think it has been clearly demonstrated, I know it has been in our organization, that if the depression with all of its troubles, with all of its handicaps, with its loss of revenue, and even in a great many cases, of humiliations to our people, if it has taught and clearly brought out to our people the use and force of organized effort and what it will accomplish, it will go down in history as the greatest dividend payer that was ever presented to agricultural America.

Let me again say that I am passing through the sunset of life, like a lot of others in this room. I have had fifteen years' experience in co-operative work in Maryland, and in leaving it I do know that I am passing out of the most useful service that I can perform to agriculture by getting every man, woman, and child it is possible to get to take up where I and the older workers are leaving off, and develop to a real point of achievement your co-operative work, for nothing will ever pay you nearly as well. Thank you!

CHAIRMAN WEAGLEY: Next we will hear from the Maryland State Dairymen's Association. Mr. I. W. Heaps is the secretary.

MR. I. W. HEAPS: Mr. Chairman, Ladies and Gentlemen of the Farm Bureau: I suppose it would be useless for me to say all the things I think have been good about the Maryland State Dairymen's Association, because I am sure what you have heard have been all the things that have been bad. I doubt whether any of you have heard many people say much good about it. We seem to be living in such a time. We are in a very critical age. We are more prone to criticize than to help, and very little constructive criticism seems to be abroad. Most of it is more likely to be destructive. I don't think that exists, of course, with you people here, but there is something or other that is not

very far from you that you might term farm insanity. The farmer has been so pressed with his financial obligations that he is past the period of being able to sit down and quietly solve his problems. He seems to be more ready to fly at anything and everything that comes in his way, and he is most likely, and it most frequently happens that he hits probably his best friend.

I can't imagine any one who is familiar with the milk industry realizing as they must do the perishable condition of milk, it being a crop that is produced every day of the year and forced into the market, that has to be marketed and disposed of in some manner every day, and yet, those individual producers are unwilling to be advised that they are destroying their best market by overproduction. They are unwilling to be advised that consumption of milk has declined in a very material way for a very good and sufficient reason, that the public in Baltimore City does not have the money to buy milk which they formerly did.

It just seems unbelievable when you sit down and try to reason it out with the average farmer, and you are impressed with the fact that he probably has not given any consideration to the consumptive demand whatever, that he has devoted his entire energies to seeing how much milk he can produce, how many cans of milk he can get on the truck tomorrow morning. If you ask him what is the matter with prices of wheat, corn, hogs, cattle, anything else, he immediately says that there is too much of it. But he never seems to realize that there can be too much milk.

I am not going to take up a lot of time. I picked up a few figures we have available at all times, thinking they might be of interest. In 1930 the members of our organization produced 27,995,481 gallons of milk. There was consumed that year 18,627,347 gallons as fluid milk. Last year we produced 27,659,158 gallons and consumed only 16,082,454 gallons. There is over 2,500,000 gallons less milk consumed, or over 10,000,000 quarts of milk less consumed in the past year than there was two years ago.

How many farmers have been willing to realize that condition existed? That is what we are face to face with. Our production remains practically the same in spite of all the advice, and persuasion we could possibly bring to bear to hold down production. We have been forced in the past 12 months to sell all of the fluid milk and fluid cream to ship out of our market, over 3,000,000 gallons of milk in the form of 40 per cent cream, and meet the world market as to price.

Now, the farmer comes in and says, "Can't you do something? You must do something. You must raise the price of my milk. I can't stand it. I am about to lose my farm, about to lose my home." I have had men and women coming into the office, a good wife with tears running down her cheeks, begging and pleading that we give them more money for their milk. I want to say folks, the last 12 months has been the most trying period of my life. In order for a man to head a co-operative organization today, he ought to have a heart of stone to withstand the pleadings that come from that source. And yet, we have, I believe today the second best milk market in the United States. Are we willing to take care of it? Are we willing to continue to hold on?

I believe that with our present price structures we are probably far above the price levels of other farm crops, and yet, our worst problem today is to keep our members from destroying the best thing they have on the farm. I think that if we could be sure that we would have the co-operation that we should have, and that we should expect from our producers, I could say that we would carry on, and we will maintain our present price structure. Without it we cannot.

CHAIRMAN WEAGLEY: Next we will hear from the Maryland and Virginia Milk Producers' Association. Mr. John McGill is secretary. (Not present.)

The next will be the Interstate Milk Producers' Association. Mr. A. Raymond Marvel, director.

MR. A. RAYMOND MARVEL: Mr. Chairman, Ladies and Gentlemen: I bring you greetings from Mr. H. D. Alabauch, the president of the Interstate Milk Producers' Association. Due to pressing business, Mr. Alabauch could not be present, so he delegated me to come in his stead.

That is why I am here today trying to substitute for the president, to make a few remarks about the Interstate Milk Producers' Association. We have had the most trying year we have ever had in the history of our organization. We have had many problems to face. Some of them have been so severe sometimes we felt we were hardly equal to the task of solving them. But we have been able, I believe very successfully, to do so.

One of the most important things in marketing milk is that we must return to our producers and members as much of the consumer's dollar as possible. That has been one of the greatest aims of our organization. We have tried to see to that. Then too, I believe there never has been a time in the history of our organizations when we should study the needs of our market more than we need to do today. We must know the demands of the consuming public. We must know how much milk or how much of any product they can consume. We must know just in what condition they would like to have the product. So it is our duty to make a thorough study of the markets. We have endeavored to control production in a way, and by so doing we have allotted each member his proportionate share of the fluid milk marketed.

I believe we are being very successful in controlling production by educating our farmers to that effect. Through the wonderful force of the county agents, and with the work of the Dairy Council, we are progressing very rapidly along those lines.

A word for the Eastern Shore, because you know that is my home. Maybe some of the Western Shore folks have never been over there. Prior to 1916 and 1917 we had no

market for our milk other than some small local markets. So the old dairy cow on the Eastern Shore wasn't thought very much of. But today we are really in the dairy business. In 1931 we marketed 12½ per cent of the milk sold in the Philadelphia milk shed. Of course, some of that came from the northern section of the Western Shore. It was valued at $3,081,627. So you see, we are really in the dairy business on the Shore.

There are five essentials, as I see it, that go with a marketing organization. First, of course, we must have an organization. We must see to it that we have as many members as possible. We must keep our members well informed, hiding nothing from them, giving them all the information we have, because surely a well-informed member is also a better co-operator.

Second, we must study the needs of our market. As I have already said, we must know the demands of our consuming public.

Third, we must produce a quality product, because certainly we cannot ask the housewife to buy some inferior product. So it is our job as members of the organization, to see to it that we produce a good product.

Fourth, after producing a good quality, we must advertise. We must let the public know what we have, and through our well-managed Dairy Council we have been very successful along those lines.

In the fifth place, but not the least, we must see to it that our farmers produce economically, because surely with the times we are having these days no one can afford to have boarder cows. A man must see to it that he feeds his cows as cheaply as possibly. So working along these lines, we feel in the Interstate Milk Producers' Association, even in the depressing times we are having, that we are successful, and that we are pushing forward.

Let me remind you of the five essentials. First, organi-

zation; second, studying the needs of the market; third, producing quality; fourth, advertising; fifth, producing economically. May I say there never has been a time in the history of our organization that we need the support back home of our members, and if each and every one will put his shoulder behind the wheel and do his bit, and not criticize the ones who are the heads of the organization, as Mr. Heaps has just said, but will do his bit and help push forward, we will make a go of it.

CHAIRMAN WEAGLEY: Due to the illness of the next speaker's wife, he will be heard later in the program. Mr. Kublin was obliged to take his wife to the hospital. So the next is the Eastern Livestock Co-operative Marketing Association. Mr. L. T. Skeffington is the manager.

MR. L. T. SKEFFINGTON: Mr. Chairman, Ladies and Gentlemen: I want to tell you it is pleasure to be with you this afternoon. I have been connected during the last few years with a good many farm organizations, and I have this to say about Maryland. As your chairman told you, we are the baby organization, and the support we have received from the other co-operative organizations in Maryland and the Farm Bureau membership in particular, gives me great pleasure, and I am glad to come here and give an account of the operations up to date. I think it is right that I should congratulate the Maryland Farm Bureau and its affiliated organizations, for their splendid efforts toward building up the livestock marketing organization in this eastern territory of the United States.

I don't hesitate to tell you that without the Maryland Farm Bureau and the Maryland organized farmers there would not have been any Eastern Livestock Marketing Association. Further, I am going to say to you that Maryland was the first State of the seven that came forward with their subscribed quota of capital stock.

I might tell you a little about its organization and financing and give you an idea of the necessity of that capital

stock. During the four month period we have been operating, we handled something over $274,000 worth of livestock.

In starting this organization, there was something over $25,000 subscribed by the seven States. The Board of Directors in good faith presumed the subscriptions would be taken up immediately on notification when we were ready to operate. The notification was given, but everybody did not come forward. In other words, we opened with a capital of $6,000 in place of $25,000. It wasn't long after opening that we found we were short of money. We went down to the yards and found we had about $18,000 worth of livestock, and it is really difficult to pay for $18,000 worth of livestock with $6,000. Hence, it was necessary to call on our good friends Mr. Cockey and Mr. Jones and other members of this organization to come forward and see if we couldn't raise enough funds to carry on. They did not hesitate, and we were able to raise temporarily sufficient funds to carry on.

At the present time I want to tell you that the capital paid in has increased to considerably over $20,000, so we are in a good financial position.

Another thing we have been able to do to some extent since we have been in the market, is decrease some of the market speculation, particularly in cattle. Another thing I want to call to your attention is that our lamb market has shown decided improvement in comparison to Jersey City since we have been here, and Jersey City is one of our competitive markets. One other thing in favor of this kind of setup which is materially different than we have in the Middle West. In the Middle West the dominating organization is the terminal marketing agency, or the sales agency at the terminal. Here the control of the organization rests with the Board of Directors selected from the seven States, all participating. In other words, terminal sales agencies are merely another cog in the marketing machinery.

There is a tremendous amount of speculation in our hog market. I believe that can be reduced to the benefit of the

farmer, because I am satisfied that if the farmer is to get a fair price for his livestock, particularly hogs, that the packer must be able to buy them as cheaply as possible, or rather as cheaply as he can, other things considered.

One other thing I wish to call your attention to. It is the relatively low price of our veal calves. I am saying that as a comparison with Lancaster and Jersey City. I believe much of that has been brought about by direct marketing of veal calves. We do not have a sufficient volume on the Baltimore market to induce any, or very little, outside competition. Most of you folks interested in the milk marketing organization can use some of the same rules in the way of collective bargaining in regard to the dairy calves that you have used in regard to milk. Those are the two things I believe we can improve—less speculation in the hog market, and an improved veal calf market.

The Board of Directors have determined upon opening an agency at Jersey City in the very near future, possibly the first of April. That will be followed with an agency in the Lancaster market. All three of these markets derive their supply from the same area. The desirability of having agencies at each of these three markets is this. You will then have a selling agency over which you have control and which has but one interest, that is, to get the most money out of your livestock it is possible to get at each one of these markets.

There is considerable competition between our Western co-operatives, many times I think without well-founded knowledge, due to possibly a little jealousy and some of our Western co-operatives will ship to a certain market when it might have been better to ship to another. With the setup you have here, we will have three selling agencies, but that competition will not exist, and there will not be a tendency on the part of Jersey City to tell them to come to Jersey City when they ought to go to Baltimore, or vice-versa. I think that will be a decided advantage to all the folks in this territory.

I want to call your attention to the volume done. I don't mean you should produce more cattle or hogs, for we really have apparently more than the public will consume at a fair price, although the supply has been relatively small this year. But I am talking about volume from this standpoint, volume in the hands of your organization will buy you more in the way of results. If you want your organization to have some prestige on the market, we must have a larger percentage of the volume that comes to the terminal.

Some of our Western co-operatives have returned millions to their members, and at the same time, have comfortable reserves set up. We have been able to do a better job of marketing from the freight rate service standpoint, because we have been able to see some reductions in our freight rates. The time has been shortened in the shipment of livestock by rail. I will give you one example. When the agency first opened at Baltimore it took 52 hours, and now it takes 36 hours. Your agency used all of its influence and the influence of its three thousand members to bring that about.

In conclusion, we have one other service we are able to render. We have been able to finance feeders of cattle and lambs. Your agency at Baltimore has furnished approximately $175,000 to cattle feeders and lamb feeders in this area. This ability on our part to help finance feeding operations is brought about by our relationship with the National Live Stock Marketing Association, with whom we recently became affiliated. The Federal Farm Board has given considerable assistance in organizing the Eastern, and it was through their efforts that we were able to do that financing. You may hear criticism of the Federal Farm Board, and it undoubtedly deserves criticism in some respects, but I believe we can all say this at least in favor of it, it has been one agricultural agency of the government that has always had a ready ear for any complaint or trouble brought to it by agriculture. We went to consult the Federal Farm Board when some of the members came from West Virginia and Virginia concerning the possibility of financing the feed-

ing of cattle. There is absolutely no provision by which the Farm Board could advance any funds. The Acting Chairman, Mr. Denman, said he could get the board together in 30 minutes and they would endeavor to see if it could be done. He did, and within an hour it was arranged so the National Live Stock Marketing Association could render financial assistance in this territory. That is very good evidence at least, that the Federal Farm Board is endeavoring to serve agriculture.

CHAIRMAN WEAGLEY: I have often thought no farm Bureau meeting was complete without the presence of our good Montgomery County Farm Bureau president. He is on the program today as president of the United Wool Growers. Mr. Jones.

MR. JONES: Mr. President, Ladies and Gentlemen: I have no excuse whatever to make because I am not on this program. I had arranged to have the manager of the United Wool Growers' Association talk to you this afternoon so he might go into detail and explain to you just exactly what we have been doing for the last three years. I am sure if he had been here you would have gotten something well worth while. About an hour before this meeting was called to order this afternoon I was told he could not be here and I was expected to say something to you this afternoon.

I will only touch upon our activities in a very limited way. I don't feel that I can go into detail, and I am going to ask Mr. Fairbank in a minute to give you that part of the program.

I think your board of directors are particularly interested in having this wool business worked out to your entire satisfaction. We realize that sometimes in the past it has not been, although it should have been. But we have been doing everything we possibly could to bring about better conditions under which this wool can be handled. I don't want to miss this opportunity to say not only your board of directors, but members of the Federal Farm Board and

the national organization have seemed to me to do everything that was possible to help handle this one product that so many of our people are interested in. The national organization, of course, does the selling. The wool is consigned to it, and it gives us orders as to where we can sell it. But the Farm Board has given us assistance on every turn.

We feel, in fact, we know in the reorganization of the United Wool Growers' Association, we are going to make several changes during the coming year. We are going to make it more convenient and more profitable in every way, and handle the product we have been handling. I am sure next year's results are going to be more satisfactory than any year in the past. We all realize the year before last, 1931, we were entirely too long in getting our report out to the growers. In fact, the accounts were as late as June in getting back final returns on the wool. At the present time, the clip of 1932 has been disposed of and the money is in the hands of the organization ready for distribution. The checks are about ready to go out, and you gentlemen should receive your returns within a reasonable time.

I am convinced in my own mind if it had not been for the Co-operative Wool Growers' Association that united as a branch in this section representing the Eastern Seaboard, and various other organizations representing the various sections of the United States, with the national organization as headquarters, I am sure this past year we would not have received more than 7 or 8 cents for our clip, whereas, under the present conditions I think it is going to net somewhere between 11 and 12 cents. Mr. Fairbank is the secretary of the Maryland Wool Pool. Therefore, he has been in touch with the office in Baltimore where our accounts are being made up, and has much more recent data in regard to that than I have, and with your permission I am going to ask him to give us a few details in regard to this matter.

SECRETARY FAIRBANK: The Maryland Farm Bureau Wool Pool, of course, as I told you in my annual report a short

time ago, marketed around 36,000 pounds or better this year which is, of course, a very small part of the total clip in Maryland, which amounts to something over a half million pounds, so we still have a long way to go. The United, of which Mr. Jones is president, has I think, made one or two changes within recent months that will materially benefit our growers here. One is they are going to completely change their method of selling. We are hoping to work out some arrangement whereby we can deal directly with the national organization rather than a local agency as we have been doing in the past, which we hope will cut down the cost of selling. The wool for this year, as I told you, has been sold for 17 cents a pound, on which we advanced 7 or 8 cents a pound at the time of marketing. It cost to sell around 6 cents a pound, which we think is more than it should be. That is one reason for changing the selling plan somewhat. But it will leave a balance of from 3 to 4 cents a pound, depending upon the grade, to be distributed to those who participated this year. I hope we will have a bigger tonnage next year.

CHAIRMAN WEAGLEY: The next is "Outline of Other Marketing Activities," by Mr. S. B. Shaw, Chief, Maryland Bureau of Marketing.

MR. S. B. SHAW: Mr. Chairman, Ladies and Gentlemen: I do want to call to your attention an activity in marketing which has been accomplished through the co-operative efforts of some of our Maryland people that indicates that the activity is not always downward. We have a group of egg-producers who have taken advantage of local conditions and demand for products, and have for the past six months been selling quality eggs on a graded basis on the Washington market. They started out being satisfied with 2 cents under the New York market for their product. Last week they were getting 4 cents over the New York market for their products.

I will try to show you by this graph comparison between

current price for current receipt eggs strictly fresh that is being paid on the Washington market, indicated by this green line. The middle line indicates the average price which these producers have received for their product, and the red line indicates the price which they have received for 80 per cent of their deliveries, because 80 per cent of the eggs which they have delivered and sold on that market are of top extra or special quality, and with that extra or advanced price which they have received they have been able to bring their average price considerably above the prevailing price for top grade strictly fresh eggs that are sold on that market.

Merely an indication of what a group of Maryland farmers can do in putting on the market a quality product and in satisfying a nearby local demand for products of that quality. It is interesting to note that the particular outlet and demand for these eggs is not being supplied by 50 per cent due to the fact that this group of producers does not have the volume to supply that active demand. Now, if there are any egg producers in the State who really and sincerely want to market their eggs on a quality basis and get a corresponding price for those eggs as has been indicated by that chart, if you want to join that type of sales outlet, take advantage of it, you can do so through the Maryland Egg Producers, Inc. They are so organized as a co-operative and strictly co-operative under the Capper-Volstead Act, that they can take in any other group or any other organization in the State.

This merely demonstrates the fact as I said before, notwithstanding the low level of prices, there is still an active demand, and at a reasonable advanced price for quality. The demand has not been satisfied. This group went into nearby Virginia and tried to get eggs to supply the demand, and the distributors can't get enough there, and they are now taking eggs from Ohio, West Virginia, and even from the Pacific Coast, in order to supply that demand. But they are being delivered there on a quality basis, and

co-operatively, and that is what means a real profit at an advanced price for those producers. That is one of the activities, Mr. Chairman.

MEMORIAL SERVICE TO JAMES W. DAVIS AND FRANK PAYNE.

CHAIRMAN WEAGLEY : I am sure the gentleman who has had close contact with the two friends who have passed on makes him fitting to lead at this time. Dr. Symons.

MEMORIAL SERVICE

FRANK M. PAYNE AND JAMES W. DAVIS
ANNUAL FARM BUREAU MEETING—1933

REMARKS BY DR. T. B. SYMONS

We will open this simple memorial service in the words of William L. Fay:

Out of the strain of the doing,
  Into the peace of the done;
Out of the thirst of pursuing,
  Into the rapture of won—
Out of gray mist into brightness,
  Out of pale dusk into dawn,
Out of all wrong into rightness,
  We from these fields shall be gone.
"Nay," say the saints, "not gone, but come
  Into eternity's harvest home."

These words, my friends, very inadequately express our feelings in the passing of our leaders and devoted friends, Frank Payne and Jim Davis. A man may be able to express the multitudious shades and variations of desire, hope, fear, relief, gratification and joy. He may stir crowds with the eloquence of oratorical art. And yet there come moments in every human life when there are no words meaningful

enough to carry from one spirit to another the thought or the feeling which the former would so gladly say and the latter so gratefully hear. The poet Whittier knew the handicap when he wrote:

With silence only as their benediction
God's angels come,
Where, in a shadow of great affliction
The soul sits dumb.

There are overtures of music, the master composers declare, which no ear can catch and no instrument reproduce. Back of anything that man may phrase in syllables are concepts, united responses of heart to heart, for which there are no words.

But possibly the incapacity to speak, the inability to express the deepest and most intense emotions, may be in itself a sign of understanding and love. Silence on occasions may be more meaningful than language ever can be. Keats believed that—when he said:

Heard melodies are sweet, but those unheard are sweeter.

And Shakespeare, mightiest master of the English tongue, never wrote more poignantly than when he put into the mouth of Richard II the lines:

My grief lies all within;
And these eternal manners of lament
Are merely shadows to the unseen grief—
That swells with silence in the tortured soul.

May the beautiful life, loving character and devoted service of Frank M. Payne, our former secretary, and Jim Davis, our beloved president, serve to inspire us to so live in the words of William Cullen Bryant:

So live, that when they summons comes to join
The innumerable caravan, which moves
To that mysterious realm, where each shall take
His chamber in silent halls of death,
Thou go not, like the quarry slave at night,
Scourged to his dungeon, but, sustained and soothed
By an unfaltering trust, approach thy grave
Like one who wraps the drapery of his couch
About him, and lies down to pleasant dreams.

May we rise and commune in silent prayer for a few moments.

Adjournment.

THURSDAY AFTERNOON

January 5, 1933

The second session convened at 2.30 o'clock, President Massey presiding.

PRESIDENT MASSEY: I would like to present to you your presiding officer for this afternoon, Mr. H. H. Nuttle, president of the Caroline County Farm Bureau.

Mr. Nuttle assumed the chair.

CHAIRMAN NUTTLE: The duty of the presiding officer is to keep things rolling. The first thing on our program is the report of the Credentials Committee. Mr. Charles Cockey, the chairman, is not present just now. We will have this report later.

The next thing on the program is an address by Dr. F. A. Pearson of Cornell University. Dr. Pearson.

THE RELATION OF GOLD, MONEY, CREDIT, AND PRICES

DR. F. A. PEARSON,

Cornell University Ithaca, New York

DR. F. A. PEARSON: Mr. Chairman, Ladies and Gentlemen: The spectacular decline in commodity prices which we have experienced in the last two years has reached such a state that the resulting situation is almost unbearable. The deflation and declining prices have meant an economic retreat, step by step, but slowly and surely, by the farmers, the home owners, the unemployed laborers, the security holders, and innumerable other groups. The struggle is becoming so intolerable that they cease to resist. A limited amount of adversity stimulates man, but too much overwhelms him.

The world has never experienced, in times of peace, such a prodigious destruction and transfer of wealth in so short a time. We are now in the midst of the most severe depression this country has ever experienced. Most measures of industrial activity are about 50 per cent below normal. During the depression of 1921, Ayres' index of American industrial activity fell to 27 per cent below normal. The panic of 1893 was the only one, prior to 1921, that carried business as much as 20 per cent below normal. In short, the business of the United States is at a level never before reached in the annals of American business. Honest men cannot get work; creditors cannot collect their debts; and "for-rent" signs appear everywhere. Changes are coming so quickly and values are being swept away so rapidly that fearless and honest men are so bewildered that they know not how to act. We are like a gassed and wounded regiment in No Man's Land. After the deluge is over we can look back and see some of our mistakes. However, while we are in the midst of the depression the farmers, the

bankers, the business men, the unemployed, and not the least, the present and incoming President of the United States are groping for light in order that, in this rapidly changing panorama, we may act promptly and wisely.

EFFECTS OF FALLING PRICES

The farmer suffers from falling prices because he has a high capital investment per worker and his business has a slow turnover.

Falling prices reduce buying. Dealers and consumers finding that they could have purchased at lower prices if they had waited take the attitude of "Why buy today; prices will be lower tomorrow."

It is commonly believed that those who live on interest from bonds or other forms of indebtedness gain by being paid in dollars that are more valuable. But they are generally losing because so much of the principal is lost. Hospitals and insurance companies and other endowed institutions suffer.

The laborer loses whether employed or unemployed. The house that he built shrinks in value the same as other people's investments.

Some persons hold that the county agent, country school teacher, government official, and other white-collared groups are favored by declining prices. However, many are unemployed. Those who are employed lose on their investments in property and securities the same as other people do. Their houses may shrink in value below the mortgage. To able persons on fixed incomes the most serious consequence of declining prices is the loss of promotion, and this may be greater than any cut in salaries that has occurred or is in prospect.

Declining prices make the nation grow poorer because millions stop producing while they are unemployed.

DEBTS

The value of the property of the United States is based on commodity prices. Livestock on farms, grain in elevators or transit, goods in the stores, commodities in a more permanent form as fences, steel rails, box cars, barns, homes, and the like, decline when prices of commodities fall.

If the property of the United States declined in about the same proportion as prices, the national wealth would be about $240,000,000,000 and the debts would represent about 85 per cent of the value of the property. The wealth of the country is shrinking so fast that any estimate at this time is a mere guess, and if right today may be wrong tomorrow. It may be that the debts are equal to the present value of the nation's property.

With the progress of civilization, business is based more and more on credit. Young men borrow money to buy livestock and tools and start farming; to buy homes; or to start in the garage, grocery, or trucking business. The major portion of these debts is based on commodity prices, and if prices fall they are difficult to pay. If prices collapse, the debtor is unable to pay, and then both the creditor and debtor lose, banks become insolvent, and if the process goes far enough additional institutions are affected.

It makes no difference whether it be the public debts, private debts, or international debts, the problem is essentially a price problem. Three years ago, with prices 40 per cent above pre-war, the English registered no protest against debts; Federal, State, and local communities met their interest and principal payments without a murmur; and farmers and home owners experienced little difficulty in meeting their obligations. With prices below pre-war, England's obligation to us and our Federal, State, local,

railroad, farm, and urban debts have suddenly become an intolerable burden. The popular way to solve the debt problem is by bankruptcy. The scientific way to solve the debt problem is to solve the price problem.

TAXES

Taxes are always rising. The progress of civilization requires a steady increase in the number of services performed at public expense. There will be little more than a temporary slowing down of this process. When prices are rising, taxes are easy to pay, but when prices fall, taxes become unbearable and there is a general clamor for reduction of taxes. In most instances the cause of the clamor is not a protest against the service or the taxes, but an expression of the inability to pay the taxes. The present inability of farmers to meet taxes is due to low farm prices. The popular way to solve the tax problem is to reduce taxes.

The scientific way to solve the tax problem is to solve the price problem.

THE AGRICULTURAL DEPRESSION

In the United States the commonly accepted explanation of the agricultural depression is over-production. The Secretary of Agriculture, the Farm Board, the United States Chamber of Commerce, and a large number of agricultural economists have taken the position that the agricultural depression is due to over-production, and that the only remedy is curtailed production.

In order to determine whether there has been a general over-production, we have constructed an index of the total volume of crop production. The production of wheat, corn, hay, potatoes, cabbage, and many other crops were combined according to their importance, and it was found that production of food and feed crops in the United States has

increased from 10 in 1839 to 100 in 1929, when the five years 1926-30 = 100. From 1839 to 1914 the production of these crops increased 3.02 per cent per year. This index also indicates that there has been a remarkably uniform rate of increase in crop production in the United States.

During the World War period we find a diminishing rate of increase in production, rather than the commonly assumed increase due to the stimulation of high prices and the pressure for increased food supplies. Furthermore, during the agricultural depression from 1921 to 1932 there was no great increase in production despite the fact that we are told that our agricultural troubles have been due to over-production. From 1915 to 1929 our crop production continued to increase, but at a decreasing rate, 0.60 per cent per year.

Prior to the World War there was a slow and gradual increase in the production of food and feed crops per capita at the compound rate of 0.74 per cent per year. Since 1915 production has declined at the rate of 0.85 per cent per year. It is difficult to attribute the present agricultural depression to over-production when food production per capita is for the first time in our history declining.

The world production of wheat per capita and the production of all crops per capita have followed approximately the same course. Our present abnormally low price of wheat is not due to an over-production of wheat in the United States or in the world.

MINERALS, FUEL AND POWER

The almost universal opinion is that the widespread urban distress is due to over-production. The physical volume of production of minerals, fuel and power of the United States has increased at a remarkably uniform rate. From 1839 to 1914 this increase was at the annual com-

pound rate of 6.43 per cent per year. From 1915 to 1929 the average rate of increase was 4.31 per cent per year.

The rate of growth of production per capita from 1839 to 1914 was 4.08 per cent per year, and from 1915 to 1929 was 2.80 per cent per year.

Apparently the nation has entered on a period of slower rate of growth of basic production per capita.

TOTAL PRODUCTION

From 1839 to 1914 the normal rate of increase in the total physical volume of basic production was at the annual compound rate of 4.03 per cent per year. Despite the stimulus of war-time demand for goods and despite the great post-war industrial boom, the normal rate of increase in our physical volume of basic production for the 1915-1929 period has declined to 2.11 per cent per year.

From 1839 to 1914 the index of total basic production per capita increased at the rate of 1.73 per cent per year. From 1915 to 1929 this rate per capita was 0.64 per cent.

Production in the United States proceeds at a remarkably uniform rate, and the outstanding examples of striking deviations are shortages and not surpluses. In 1921 and 1930-2 there were striking examples of great shortages in production. The most striking changes in our physical progress occurred as a result of the World War and the panic of 1929.

WORLD GOLD STOCKS AND PRICES

If we do not find a satisfactory explanation in the supply of or demand for commodities, we must turn our attention to the supply of or demand for money.

World gold stocks in 1850 amounted to 54 million ounces

and by 1910 amounted to 340 million ounces. If these are expressed as index numbers with 1880-1914 equal to 100, the stocks of 1850 are 23 and of 1910 are 147. In this same 60-year period index numbers of production rose from 22 to 140. The ratio of gold-to-production was 105 in each year. Prices in England were 105 in 1850 and 106 in 1910. At the end of the 60-year period gold stocks had increased the same amount as the production of all commodities and prices were unchanged. The trends of the ratios and of prices were identical. The amount of gold required to support a given amount of business remained unchanged.

TABLE I.

RELATION BETWEEN WORLD'S MONETARY STOCKS OF GOLD, PHYSICAL VOLUME OF PRODUCTION, AND WHOLESALE PRICES

Year	World monetary gold, millions of fine ounces	Index of gold stocks, 1880-1914 = 100	Index of world physical volume, 1880-1914 = 100	Ratio of gold stocks to production, 1880-1914 = 100	Prices in England, 1880-1914 = 100
1850	54	23	22	105	105
1870	131	57	42	136	131
1890	169	73	74	99	98
1910	340	147	140	105	106
1914	388	168	146	115	117
1929	550	238	208	114	156
1931-32	580*	252*	222*	113*	93*

*Estimated.

From 1850 to 1870 gold stocks increased much more rapidly than production and the ratio of gold to production rose from 105 to 136, and prices rose from 105 to 131. From 1870 to 1890 gold stocks increased very slowly. The ratio fell to 99 and prices dropped to 98.

For the 75 years before the war prices rose if the world's monetary stock of gold increased faster than the production of other commodities and fell if gold increased less

rapidly. There are short-time discrepancies in the normal relationship of gold stocks to production and prices, due to business cycles and other causes. The discrepancies have always been followed by a return to the long-time relationship.

Since the Civil War the same relationship holds for the United States prices. During the Civil War period the discount on the currency was greater than the rise in prices, a normal occurrence when a country leaves the gold standard.

GOLD PRODUCTION AND STOCKS

If world monetary stocks of gold must increase at a fairly normal rate to maintain stable prices, we must turn to world gold production to learn whether it is keeping pace with the normal rate of increase. With the discovery of precious metals in the Western Hemisphere the stocks of precious metals increased and prices rose. From 1810 to 1845 world gold production was low. From 1850 to 1860 it mounted rapidly, due to new discoveries in Australia and California. Thereafter gold production declined and reached a low ebb in the nineties. This, in turn, was followed by a rapid increase and a new peak in production was reached in 1915. The known mines were passing their zenith of production and the high prices during and following the World War have curtailed gold production in recent years.

Gold production is very erratic compared with monetary stocks. The changing gold production inevitably affects monetary stocks at a later date. For instance, in 1852 the world produced 6.7 million ounces, which was 10.6 per cent of the monetary stocks (63 million ounces). In 1883 it was 3.0 per cent. After the discoveries of gold in South Africa and Cripple Creek gold production reached 14.8 million ounces, which was 6.6 per cent of stocks (226 million ounces). The highest per cent was in 1908, 6.8 per cent.

With the World War production declined to 15.5 ounces in 1922, and was only 3.2 per cent of monetary stocks. The per cent that present world gold production is of monetary stocks is below normal.

It is therefore quite apparent that it fluctuates violently.

Whenever gold production has been less than 5.6 per cent of stocks, it has been followed by a decline in the price level. Whenever it has been more, it has been followed by a rise in the price level.

High or low production is only slowly effective on stocks. Therefore, prices lag. For the United States the best fit has been with a lag of about 13 years. This is accidental, as it depends on the rate of gold production. If a gold supply equal to monetary stocks were found in a single year and added to the stocks, prices would be expected to double in the following year.

THE OUTLOOK

Business and agriculture can proceed at any price level, provided that all prices and costs are in adjustment. At the present time debts are out of line with prices and business cannot continue until the price level is raised to the debt level, or the debt level is lowered to the price level. There is no alternative. The government policy has been to postpone bankruptcy by means of government lending with the hope that prices will rise, but business cannot start until debts and prices come into adjustment. When this adjustment takes place basic commodities will rise sharply in price. Obviously we are now in a very serious dilemma. The debtor cannot pay and the creditor cannot collect. Apparently our policy has been to temporarily retard liquidation. This plan was based on a conviction that easy money and credit as provided by the Federal Reserve Bank in conjunction with the Reconstruction Finance Corporation would result in improved business and

rising prices. This plan has been a sad disappointment. The answer is easy. Business will not improve until the debt level and price level are equalized.

We must therefore choose between deflation or reflation. No country likes to change its monetary system, nor does any country like to go through wholesale bankruptcies and continue to have millions of unemployed. Our choice is not between two desirable things. It is between two undesirable things. Merely raising the well-known objections to either procedure does not commend the other. The question is: "Which is worse?"

If we wish to go through with deflation we may as well proceed with the bankruptcies, foreclosures, and public defaults and get them over with. Merely postponing by lending some money or attempting to hold up the price of this or that thing will accomplish very little.

DEFLATION

If deflation is completed the following are some of the innumerable adjustments yet to be made.

At the new price levels public and private debts are nearly equal to the national wealth. These debts will have to be reduced. The only plan thus far proposed for reducing them is bankruptcy and private adjustment. While the more serious part of this is taking place bankrupt homes, farms and other properties will always be for sale at less than new costs of construction, regardless of how low these costs may fall. Therefore little building of any kind is to be expected. Consequently most of the basic industries will operate at low capacity and severe unemployment will be continuous.

Public debts will increase and some of the government units will find it impossible to meet their obligations. The taxpayers pay these debts.

Adjusting a price level down requires much more time than adjusting it up. It is not difficult to adjust public and private debts to a higher price level, but it is very difficult to reduce them. To adjust debts up merely requires that the usual purchases be made at the new price level with the usual percentage of credit transactions. To adjust debts down means the slow process of bankruptcy. Bankruptcy acts like a house of cards—each bankruptcy starts another.

Bank deposits will decline because of the reduced amount of business and the lower prices at which business is done and the tendency to use cash rather than checks. This latter movement is encouraged by fear of banks, lack of banks, lower interest payments on deposits, charges for checks, taxes on checks, and high postage rates. Further bank failures will occur.

Because of severe unemployment some persons are working for extremely low wages, but it is not to be expected that the general wage level will decline to the price level. Whenever the debts are liquidated so that business can proceed, wages will be far above pre-war.

Interest rates will be much below pre-war for safe securities, but a large part of the business will be on such a precarious basis that, for some years, rates for agriculture and industry may be high.

The size of fire insurance policies will be reduced, losses will be increased, and rates probably will be raised.

Innumerable prices which have not declined will fall. Some of these are freight rates, telephone charges, price of newspapers, doctors' fees, dentists' fees, and telegraph charges.

Large numbers of corporations will disappear by bankruptcy or by combination to avoid bankruptcy.

Wholesale writing down of the capital of industrial plants, farms, and city real estate will be necessary.

Costs of distribution will gradually decline so that prices paid to farmers will again come into adjustment with the prices which they pay.

Some basic commodity prices have fallen too low even for the conditions and will rise.

Innumerable measures will be tried in attempts to hold up prices of this or that thing. Tariffs, bounties, farm boards, domestic allotments, restrictions on trade between States under sanitary and other guises, pools, gentlemen's agreements, and many others will continue to be tried. Some of these may do a little good, but they will result in disillusion and disappointment.

If we are going through with deflation, we should promptly establish debt adjustment commissions. The legal system of writing down debts works badly enough when only a few bankrupt properties are thrown on the market. It destroys values for both the creditors and lenders when applied in a wholesale way. A creditor often takes over a home or a farm, keeps it in hopes of a sale until the carrying charges eat up much of the value. In the meantime the property depreciates. Finally, in despair, a "shoestring sale" is often made to a less desirable buyer than the dispossessed owner. Debt adjustment commissions should study each case and make recommendations for settlement for all creditors. Such recommendations from a disinterested party would save many owners and help many lenders, and would keep many of the cases out of the courts.

REFLATION

The effect of rising prices is the same regardless of the cause. If for any reason the price level is restored, it does not mean that all prices will rise equally. Many prices have not declined, or have declined little. Restoring the price level would relieve them of the necessity of declining. The major ones are debts and taxes. If commodity prices

were raised, buying would begin because rising prices cause buying. Jobs would be available. Houses would be in demand. The debts and taxes on the houses and farms could be paid, and the debts would not have to be cut by bankruptcy.

The former amount of life insurance would be desired.

Many charges, such as freight rates, doctors' fees, telephone rates, and the like, are already adjusted to the price level that would be established. They would not rise, but would be relieved from falling.

Costs of distribution would rise very litle. Therefore, prices paid to farmers and other producers would rise much more than retail prices. This would bring farm prices into adjustment with other prices. It is sometimes said that two steps are necessary; first, restore the price level; and second, restore the relationships of farm prices to other prices. If the first step is taken, the second follows automatically.

Prices of basic commodities such as copper, corn, wheat, and cotton would rise very decidedly because they are so far below the price level that would be restored.

The declines in values of homes and farms would be stopped.

In general, the prices that have not yet declined would be relieved from declining, and those that have declined would be restored.

Probably nothing is more universally wished for than a rise in commodity prices. We are willing to have the Farm Board buy wheat and cotton, pile tariff on tariff, lend billions of government money—all in the hope that commodity prices may rise. But when any proposal is put forward that will raise the whole price level, it is commonly considered sacrilegious. There is probably no other subject

on which so many people have formed positive convictions without scientific evidence. It is the responsibility of farm organizations to give consideration to the various possible methods of procedure.

STABILIZATION PROPOSALS

Stabilizing the commodity price level does not mean that any single commodity will be free from fluctuations in price due to the supply of it or the demand for it. It does mean that commodity prices as a whole may be freed from being swept up or down as a mass due either to world supply of gold or frantic changes in the demands for it. There are many proposals for limited or complete stabilization.

CHAIRMAN NUTTLE: We are certainly indebted to Dr. Pearson for coming here from Cornell and giving us these facts. You know, most of us farmers and laymen are hardly equipped to go into things like this. We know something is wrong, but we don't know what it is. Dr. Pearson is a scientist and has gone into this in a scientific manner. The farm Bureau have proposed a remedy, which Chester Gray, our legislative representative, will present later in the afternoon. It follows up Dr. Pearson's address.

MR. SPARKS: We have just heard of the death of President Coolidge. I think it would be a fine thing for this audience to rise and remain silent for a few minutes.

Done.

CHAIRMAN NUTTLE: We will now have the report of the Credentials Committee by Mr. Charles T. Cockey, president of the Baltimore County Farm Bureau.

Mr. Cockey presented the report of the Credentials Committee.

REPORT OF CREDENTIALS COMMITTEE

Your Credentials Committee has examined the records submitted by the Secretary-Treasurer of the Maryland Agricultural Society-The Maryland Farm Bureau Federation and find the following county and affiliated organizations in good standing and recommend in addition to their duly authorized director the seating of delegates as follows:

FOR THE COUNTY FARM BUREAUS

County	Number Members Paid	Director	Delegates	Total
Anne Arundel	9	1	....	1
Baltimore	202	1	4	5
Cecil	55	1	1	2
Caroline	40	1	1	2
Carroll	58	1	1	2
Dorchester	24	1	1	2
Frederick	231	1	4	5
Harford	237	1	4	5
Howard	81	1	2	3
Kent	72	1	1	2
Montgomery	82	1	2	3
Queen Anne	95	1	2	3
Talbot	89	1	2	3
Washington	33	1	1	2
Wicomico	82	1	2	3
Worcester	28	1	1	2
	1,418	16	29	45

FOR THE AFFILIATED ORGANIZATIONS

	Director	Delegates	Total
Maryland Stockmen's Association	1	1	2
Maryland Beekeepers' Association	1	....	1
Maryland Crop Improvement Association	1	1	2
Maryland Vegetable Growers' Association	1	1	2
Maryland Poultry Association	1	....	1
Maryland Tobacco Growers' Association	1	....	1
Agricultural Corporative of Maryland	1	2	3
Maryland State Horticultural Society	1	....	1
Maryland State Dairymen's Association	1	3	4

This will make the convention consist of 45 delegates from the counties and 17 from the federated organizations, or a total of 62 delegates, entitled to vote. In addition to this, the President and Vice-President and the Chairman of the

Home and Community Committee of the State Farm Bureau Federation are entitled to vote.

Respectfully submitted,

CHARLES T. COCKEY, JR., *Chairman,*
W. L. SMITH,
D. B. MCDOWELL.

MR. COCKEY: I move the adoption of this report.

Seconded by Mr. Funk and carried unanimously.

CHAIRMAN NUTTLE: The next thing on the program is the presentation of medals to the vocational agriculture boys. I will ask Mr. J. D. Blackwell, head of vocational agriculture in the State, to take charge of this part of the program.

Presentation of medals to the boys.

Presentation of scholarships from the Baltimore and Ohio Railroad by O. K. Quivey, agricultural agent, Baltimore and Ohio Railroad Company.

CHAIRMAN NUTTLE: I am sure we appreciate having these young people with us. We look to them for future leadership for agriculture.

The next is the presentation of the tax report, which we wish presented now for the benefit of certain members of the Maryland Legislature who are here. I will ask our Secretary to read that report.

Secretary Fairbank read the report of the Tax Committee.

SECRETARY FAIRBANK: I move the adoption of this report.

Seconded by Mr. Snader and carried unanimously.

CHAIRMAN NUTTLE: It is, indeed, a privilege to present at this time Mr. Chester Gray, who is in charge of our Legislative Bureau in Washington, and he is doing a wonderful piece of work for us down there. Mr. Gray:

MR. CHESTER GRAY: Mr. Chairman, Ladies and Gentlemen: At Washington this winter, organizations of citizens and townspeople, of farmers and bankers, of laboring groups, and women's organizations, are speaking very fluently for what they want government to do or what they desire not to have government do for their own welfare. It has come to be a great national pastime as well as a duty, that organizations of people represent their wishes at national and State capitals, and so when your Chairman refers to me as a legislative agent, or as a Washington representative, or when I refer to myself as I am frequently referred to at Washington, as a lobbyist, there is no reprehensibility in those terms, because lobbying has come to be, if not a necessity, then a common practice among all groups in America, and the reason primarily that it is so attacked from certain quarters, is that the people themselves now through their groups, farm and urban, are letting themselves be known, whereas, from time immemorial until the last ten or fifteen years, lobbying was done by the private interests, by the vested interests in their own behalf, in hidden, secret, and covert ways.

So speaking of lobbying, this winter there will be five or six great issues which farm organizations, not only the American Farm Bureau Federation, but others, will be active in, and I shall devote 30 or 40 minutes to analyzing and naming these 6 or 7 big projects.

First of all, let me follow in that very admirable but too brief question of money, the monetary question, which Dr. Pearson gave to you this afternoon, as one of the big things the American Farm Bureau Federation and many another group in Washington is devoting themselves to. We hear so much nowadays about low prices on farm products. The town man complains about low prices on industrial products, and virtually he has as much cause for complaint as we in agriculture, speaking comparatively and approximately. But perhaps it is not altogether the low price of farm products which is hurting us, which is causing our

farms to be foreclosed, which is denying us to buy more than 25 per cent on a national average that which we bought five or six years ago. Perhaps it is not the low price of farm products alone that is worrying us, but perhaps it is the exchange value of our farm crops in relation to the total that is hurting us, and that is what we are thinking about, and that is what Dr. Pearson was driving at and what he would come to if he had had 30 minutes more of our time this afternoon. The dollar has come to be high in America, as over the world; it has come to be high for several reasons, which I shall not go into. As the dollar gets high, it takes more pounds of beef, more bales of cotton, more bushels of wheat, or more gallons of milk to buy that dollar than when the dollar is cheaper in value.

We have to give now to buy a dollar four times as many bushels of wheat as was necessary to give five years ago. We have to give three times as many bales of cotton or pounds to buy a dollar now as we did a few years ago. In fluid milk in most of the milk sheds of this great nation of ours, it takes from two or three times as many quarts of milk to buy a dollar as it formerly did. We say the price of milk is low; we say the price of cotton is low. The man who makes boots and shoes says the prices of boots and shoes are low. Superficially that is true. Analytically it is not true, because those things are low largely, not wholly, because the price of the dollar is high.

Now, some fellows will rush to the conclusion that a farm organization will not touch the sacredness of the dollar. But we have only one fixed price in American civilization that I know of, and that is the price of a dollar. For the last few years fluctuations unduly great in commodity values have seemingly made an effort to equalize the fixity of the dollar value, and as the dollar goes up, prices have gone down, and when that time comes, if the dollar goes down unduly, prices will go up, and we have had both cases in our American civilization.

The American Farm Bureau Federation four years ago

enunciated the principle there should be established a basis of equality, or an average line of price between the dollar and all commodities, taking a certain period of pre-war character as being typical of 100, where prices of agriculture and other commodities were satisfactory. We say, take that as the indicator, the yard stick, and through the Federal Reserve Board, which is the arbitrator of currency matters in the United States, order that board by its handling of discount and rediscount trade, by its control over the interest factor in monetary matters, by its ability to change if given legal power, the gold reserve back yonder in the vaults against which paper money may be issued, and by enlarging all those powers of the Reserve Board, give it some authority which will permit it to hold the line more nearly on the level between commodity and dollar values. We advocated that. We passed a bill in Congress known as the Goldsborough bill championed by a Congressman from your own State, which sought to do those things. The bill didn't get through the Senate, and is not now law, and probably if it had gotten through it wouldn't have maintained that line of parity or equity between the value of the dollar on the one hand, and the value of all commodities on the other, because the bill as we proposed in the last session didn't go far enough.

Now farm organizations, not only the one I represent, and the celebration of which you are meeting here this week in the Maryland Federation, but in other farm organizations also, in labor and industrial groups, we now say in our annual proclamations that that is an agreed thing which has heretofore been called the dollar and has a certain number of grains of fine gold in it valued fixedly since 1834 at a certain price, might by the authority of the Reserve Board be changed in its value as economical conditions change, so that the dollar, becoming scarce, will not come to be so high in value, thus making all commodities low; or in reverse, that the dollar will not become so common as to become ridiculous, thereby making all com-

modities reach the sky. One extreme is just about as bad as the other in the long run of human events.

That is the program of the American Farm Bureau Federation on the monetary proposition. It does not mean fiat money, it does not mean ridiculous inflation, it does not mean uncontrolled use of the printing presses like Germany did right after the war to turn out all kinds of monetary paper, but it means lodging in the Reserve Board, which we must trust and are now trusting with monetary affairs in this nation, more power than that Board now has to control a line of parity or equipoise between the dollar values and commodity values.

Another thing we are going to wrestle with there this winter is in direct keeping with the report Mr. Fairbank read here, the taxation question. I like to synchronize my remarks, extemporaneous as they are, with the rest of the program in which I participate. And now for taxation, may I say that nothing so far as it applies to Federal principles of taxation which is incorporated in the report you have just heard read, is in violation of the principles of the American Farm Bureau Federation on taxation. We believe, speaking of the American Farm Bureau Federation, that the main resource of Government in getting funds wherewith to operate is the income, corporation, inheritance, and gift taxes, and that has been the main reliance of Uncle Sam's government through and since the World War period. Great efforts are being made constantly to break down the efficacy of what we may call taxation on the basis of ability to pay, which means the income tax methods of taxation. People say that taxation as proposed at Washington ruins business. In the height of prosperity before the collapse and calamity of 1929 people came before the Ways and Means Committee there at Washington when individuals and corporations were making money hand over fist, and said, "We must reduce taxes and the brackets and the rates thereon, or else industry, corporations, and business will go to the dogs." That was said in the height of prosperity. And they whit-

tled rates and brackets down gradually in a ten-year period so that when depression did come in 1929-30 and subsequent years, the rates, or the brackets as we call them at Washington, had been reduced so low that with the lessened earning power of people and corporations the income of Uncle Sam from those sources of taxation which I have named, came to be less, and came to be so much less that he found himself in the red one morning two billion dollars.

That convinced them there was a depression. Then the clamor was to reach out and get taxes from some organizations or others to balance that budget, and they sought last winter and all through last spring and summer to put taxes, listen, on the very same people all over the United States, in towns and on farms, who owned the general property of the nation, and who are now overburdened inexorably with the general property taxes in county, township, and State. They sought to impose in Washington a general, a federal, or a manufacturers' excise tax, all meaning so far as the citizen is concerned, the same thing.

The Farm Bureau Federation has since its creation 14 years ago, fought any general federal sales tax, and we fight it for two reasons. First because it is based, not on the ability to pay, but on a necessity to consume. Second, that just as quickly as the sales tax principle of a general nature gets incorporated into the federal tax structure, down will tumble the income tax principle which Uncle Sam has found his main reliance on, through, and since the World War period, and they who advocate a general sales tax at Washington advocate it primarily for that last position. They want a general sales tax so that the burden will be paid over the retail counter by those same people who own the general property and pay the taxes of the nation, and by getting that system into the federal tax structure they can gradually whittle out and melt away the income, corporation, inheritance, and gift taxes.

May I discriminate between a sales tax of a general nature

at Washington and a sales tax of a specialty nature in a State tax statute. The discrimination is this: At Washington a sales tax, whether it is a specialty tax like we have now on gasoline, or a luxury tax, like on some of the non-necessities, or whether it should be a general, flat, horizontal sales tax, it cannot be a supplanter of or a displacer of the tax burden you are now bearing. If you put a general sales tax on at Washington, a specialty tax, it is a super and above tax to those you are now paying. It is not a replacement tax to any of the burdens you are now laboring under in the way of taxes. At Annapolis, however, if you want to put a specialty sales tax on a few things, if you want to put a general State tax on, and at the same time remove a portion of your general property tax burden, you have made of that new tax system a replacement mechanism. You have helped your citizenry. But at Washington that cannot happen. A general or special sales tax at Washington is over and above all other taxes which you are now paying.

May I say statistically, that the people who own the general property of this great nation of ours, townspeople and country people who own the tangible property which cannot be hidden, which every year irrespective of profit made thereon pays taxes, are the people who consume more than half the necessities of life, buying those necessities over the retail counter. Put a sales tax from Washington on that great group, and you are further limiting their ability to buy, and frankly, tracing the cause of this depression back to one of its sources, we find that source to be, ladies and gentlemen, the inability of the great rural population, which is fully 50 million people, they in small towns and they on the farms, who have receded from the purchasing side of life as much as humans in American civilization can recede. We farmers are not buying what we used to buy, and when we keep that up long enough, smoke stacks on factories grow cold. And that is what happened. When you take fifty million of our people off the buying side of

life, and we are down now practically to a 25 per cent level of purchasing compared to 100 per cent of normal American agricultural life, the whole nation sooner or later is going to come to its economic knees. And that is where the nation is at the present time. And if you put a great tax burden at Washington in addition to the present intolerable local, county, and State taxation on this great consuming population, you have not hastened the return of prosperity, but you have retarded it immeasurably by decreasing the ability of the agricultural and rural population to buy.

Another thing which I must hasten along to is the road question, and that is directly integrated with the question of general agricultural appropriations at Washington. A great clamor goes up now about reducing the costs of government at Washington, saying nothing about State government, because that is in your program here read by Mr. Fairbank a while ago, and very adequately treated in my judgment. But at Washington there must be a reduction of government costs, too. It took us about fifteen years to unbalance the Federal budget by asking the Federal Government continually, year after year, to do more things for us than the government theretofore had done. And remember, everything the government does for us farmers, everything the government does for our city cousins, costs money and must be paid for by taxes derived from one source or another, and we in agriculture and they in commerce have asked the government to do many things, not a hundred, but a thousand, and which twenty-five years ago our forebears would never have dreamed to ask the government to do for them. And in the last fifteen years we have unbalanced the budget, and some people clamor at Washington, "Balance the budget." They say it as though it could be done instantaneously, or in thirty days. Last winter, and now this winter, the clamor at Washington is to balance the budget.

I appeared before the Ways and Means Committee just about a year ago now in the midst of that clamor, and I

joined in it by saying, "We are going to balance the budget, but in my judgment, speaking for the American Farm Bureau Federation, instead of balancing it next June (which is now June last) you can't balance it until 1934." Taking ten or fifteen years to unbalance it you hardly can cut the cost of government instantaneously and spectacularly all at one slice, nor can you raise taxation enough in time of depression. And yet people demand balancing a budget which has taken ten or fifteen years of gradual piling up of expense to unbalance, and the budget isn't balanced yet, and in my humble judgment it is not going to be balanced next June, no matter how much we cut the cost of government, nor how much we figure and change and alter the tax rate at Washington. Things are not done that quickly in a great civilization and in a great government flung from Maine to California as we have. But the costs are going to come down, and they are being brought down, and they are being brought down with the consent of the American Farm Bureau Federation, and we are willing to bring down the costs if the other functions which Uncle Sam performs are brought down in like proportion. But unless that is done we will fight reductions for agriculture greater than those for other functions and services of the Federal Government.

In my judgment there will be a reduction of the Federal costs of government consummated in this winter's session of Congress of approximately $500,000,000. In the last session they were going to economize a billion dollars. That is what they were doing to do. How much did they get? About $100,000,000. That is about the amount they economized in seven months of tremendous endeavor.

A part of your tax burden is on roads. I don't know so much how it is in Maryland, but I know in other States many a farm community has mortgaged its future for 20 to 30 or 40 years in levying special road taxes and voting bonds to build highways. Of course, you people in the rural districts of Maryland have been too wise to do a thing like

that, but out in Ohio I happen to remember the statistics taken five years ago, that 66 per cent of the highway system in Ohio prior to the Federal aid system had been builded by taxes on contiguous property, that property bonding itself in highway districts. At that time when the survey was taken all the farm assessment value in the State was only 27 per cent of the full assessment value of the State of Ohio. That survey also showed that of the use of those highways builded, as you know now by 27 per cent of the property in the State, and that 27 per cent spent 66 per cent of the total cost of the highway system, and after that is done the farm use of the highway was only 11 per cent of the total use.

Now, that kind of thing, this road building, not only has got to stop, but has stopped. We are in the period now of State and Federal aid for highway building. A highway now when builded comes to be an artery of commerce, not a neighborhood trail as it was 25 and 50 years ago. As soon as it becomes an artery of commerce, State or interstate, it becomes possessed of a great depreciation which the abutting property cannot rebuild, nor can it afford to build stable enough to carry the traffic of nowadays. So the time has gone by of the farmers building the highways. The time is here when the nation is building the highways, and Federal aid for highway building is going to continue in Washington, perhaps not at those great amounts of millions of dollars which was characteristic of the last Congress, where more than $200,000,000 was appropriated for highway building, but Federal and State aid is going to continue, for I notice here in your report that you are advocating State aid to come out in the counties and help you build county roads. So likewise the State is saying to Uncle Sam, "Come with your money and help us build highways."

Now, an odd thing has developed. Last year we had lots of unemployment in the nation, so many people were said then to be out of employment, and from the President of

the United States down to the least conspicuous member of Congress it was said to be a great and glorious way to remove unemployment by appropriating great chunks of money to build highways. Figures were stated that every dollar in highway building goes about 80 per cent to labor. Therefore, if you want to remove unemployment, build highways, because the money gets out to labor. I am not denying the accuracy of the figures, because I used them myself. But what do we find in Washington now? Just as much unemployment in the country, I am told, and about a million or two more than there was this time last year. If highway building was such an all-fired good method a year ago for removing unemployment, how does it happen that it is so ineffective this year in removing unemployment? Last year over $200,000,000 was appropriated by Uncle Sam to build highways, this year $35,000,000—with two million more people out of employment. What is the answer? That was before election, and this is after. That is the answer.

A funny thing happened in Washington, even among farm organizations. I will not speak of that, because I am among one of those, but the highway building program is one of the great costs of Uncle Sam's Government. I don't mean to say it is going to continue at the peak which it rose to a year ago, but I do mean to say that the principal Federal aid is necessary and is going to continue.

Another thing we are going to wrestle with this morning. I am going to devote myself briefly to another great project which we are going to have before us, and remember that I have already enumerated and hardly described, but named the monetary question, the taxation question, and the appropriation question. Now we come to the farm mortgage question. You have heard of that. It is applicable to other States, of course, but has no applicability to Maryland, because surely there is no farm mortgage question in the State of Maryland. But just so that you may be informed of the hard-up necessities of farmers elsewhere in the United States, may I say that owing to the foreclosures

which are going on all over the United States in greater and lesser amounts in different portions of this great nation, we are growing rapidly and more rapidly to be a nation of renters on the farms. That is a side of the foreclosure question that superficial consideration of it does not give attention to, but as foreclosures go on ordinarily in most parts of the United States, the rental proposition assumes more importance, and already in some of our great agricultural States more than half the farms are farmed by tenants, and whenever that condition comes in any great American civilization or any portion thereof, it does not augur the most hopeful future.

I have a 400-acre farm in Missouri, and Missouri is not threatened with the rental proposition like other States might be, but on that farm of mine with several miles of contour, only two farms adjoining it are owned and operated by the landlords themselves, and they happen to be one farm of 60 acres and one of 80. I am almost completely surrounded by renters. That doesn't mean the renters aren't as good as I, because they are, and in many cases, better. But as perpetuators of American agricultural civilization, a renter, if he be me or you, is not necessarily as long-visioned as a landlord operating his own place.

The foreclosure situation is on us, and at Washington you ask, what can we do about it? We can do several things, and the most immediate thing we can do is to have a federal law passed, and I am not going to believe no aid can come from Federal legislation, or else I would not be at Washington. But we could have a Federal law passed guaranteeing bonds in the Federal Land Bank System, and in addition to that, let Uncle Sam, as he did last year when he put in $125,000,000 as the capital stock of the 12 regional Land Banks, let him put in some more millions of dollars additional capital stock to make more operative the Land Bank System, and to give more leniency to these farmers in the System who are hard pressed and are near the sheriff's hammer guaranteeing the Federal bonds, and more money

in the Federal Banks in a year would take care of a billion dollars in my judgment of the most hard-pressed farm mortgages at the present time. It won't take care of them all, and they don't all need to be taken care of in a year. I don't care how beneficial we men make our federal law in regard to farm mortgages, nor how you dovetail State laws into the Federal law, a large portion of the Federal farm mortgage debt, perhaps a fourth of it, never will ask for refinancing, because it is perfectly satisfied with its present financing. But a billion dollars of it is at the sheriff's door, and if you guarantee the bonds, whether the mortgages are held by the eastern loan companies, by joint stock Federal Land Banks, or by private agencies, if the farmer is hard pressed and cannot meet his obligations, an eastern mortgage company or a private holder of a mortgage would rather swap that mortgage for a guaranteed government bond at 3 per cent than to continue carrying his mortgage. Guaranteeing of the bond plus additional Federal capitalization of Federal Land Banks will tend to clean up in a year the hard-pressed mortgages of the nation; not all, but a portion of them. Those which are hard pressed, and those which are less desirable from an investment point of view are the ones we have got to attend to first. And in future years with those two propositions carried forward in the Federal law, it will mean that more and more mortgages as taken by new farmers will be taken into the farm loan system. It will mean in future years a gradual liquidation from the mortgage companies and private holders, of course, into the farm loan system, because as I have said, many a mortgagee, the one who loans the money, would rather have a guaranteed bond at a low rate of interest than to be troubled with a mortgage at a higher rate of interest. That is a line of argument which is worth while considering, and that is a line of legislation which it is possible to have enacted this winter, and in my judgment, there is more hope of farm mortgage legislation at Washington this winter than any other single thing which I have named or which I yet could name if time permitted.

I don't believe that this Congress is going to do anything of direct agricultural significance except on two things, the Philippine question, which it has already handled rather disadvantageously to agriculture, and the farm mortgage question. It is not going to settle this monetary question I have spoken to you about. It is going to do something to the taxes, but is not going to change the tax structure much. It is not going to put in a Federal sales tax, may I tell you humbly, although efforts will be made to do that. And of direct agricultural significance, the Philippine bill and the farm mortgage bill are about all we are going to get out of this Congress.

The Philippine bill is a bill about 50 per cent in favor of the farmers. It protects American capital invested in the Islands, sugar capital, cocoanut oil capital. We were fighting for a five-year bill so those large tonnages of Philippine oil, and sugar, and lesser tonnage of pineapples, rice, and tobacco would not compete with us, come in here duty free and add to our surplus, but instead of a five-year bill we got a 12-year bill. But that is better than a 20-year bill, because it was a 20-year bill when the Senate began on it the first week of this session of Congress. We whittled it down to 12, so it is about a 50 per cent bill, half agricultural and about half protective of the vested capital, largely our own, in the Islands.

Another thing I can refer to is the surplus question. I have mentioned it in connection with the Philippine question. The Philippine question, as long as it remains unsolved, adds to the surplus question of American agriculture, because those products come in here and they add a large quantity to an already over-pressed or over-depressed market. We have been wrestling at Washington with the surplus question. I rather am a believer in what Dr. Pearson said a while ago in his charts, that there is no overproduction, but you can't make Congress believe that. Therefore, Congress has been wrestling for years with the surplus question

and is now, but she is tackling it differently now, and so are farm organizations, than they ever tackled it before.

We have wrestled with that question 10 years at Washington, trying to control the surplus after it is created, to keep it from depressing the price. Now Congress has gone off on a tangent. She says to the American farmer and the farm organizations which are sponsoring the movements, that we had better tackle the surplus question at the other end and try to prevent its creation. Therefore, the domestic allotment plan is now receiving much consideration and some favor at Washington, and that plan substantially is this, that if a farmer raising any crop will reduce his production for a certain year to the per cent which the Secretary of Agriculture promulgates at the beginning of the year, all farmers producing that crop should reduce it in order to supply the whole market, then when he offers that crop for market he will get in addition to the regular going price an adjustment certificate, or a reward, or a subsidy, or whatever you care to call it on each unit of that commodity which is going to be consumed in the home market, and that certificate will be based on the difference between the going price at the time he sells it and the price in a certain prewar period where farm prices were better than they are now. For instance, if you should take a bushel of wheat or a can of milk to market you would get the going price, but if you were able to show to the processor or to the marketing agent that you had reduced in keeping with the requirements of the Secretary of Agriculture in that community, you would get in addition to the regular price, an adjustment certificate equal to the difference between the regular price and that prewar era designated in the bill. It might be on wheat 50 cents a bushel, it might be on milk 2 cents a quart, but you would get that.

You get it in the form of a certificate. That certificate is negotiable, cashable at the Treasury of the United States or any agency thereof, any bank that is solvent and doing business. In 30 days you can cash that in part, or in 60

days you can cash it all, and you then would be rewarded to the extent of that adjustment certificate per unit of your commodity for those units which you are selling on the domestic market, providing you could show that you had reduced your production in compliance with the Secretary of Agriculture's requirements. It is rather involved, rather technical, but it is an effort to control surpluses at the source rather than control surpluses after they have been created. That question is before Congress. It will be wrestled with all this session of Congress and might be enacted into law, I don't know. It has delayed but not displaced our active interest in the matters of appropriation, and has delayed but not displaced our interest in farm mortgage legislation. That is the way with things at Washington.

May I conclude and say in review, that the monetary question, the Philippine independence question, the surplus question, the farm mortgage question, the question of taxation, interrelated to the question of appropriations, are all on the program of the American Farm Bureau Federation, and their component corollaries are on the program of the Maryland Farm Bureau Federation. You are doing in your State activities at Annapolis and throughout the entire State of Maryland, in a lesser geographical way, but in no less an economic and important way, the same things that we are doing at Washington. So we are working together.

May I say that it is a happy word to bring to you, that not only is the Farm Bureau Federation in its State units and its national unit working on the same economic basis, and on the same legislative projects, but all other farm organizations, co-operative, or membership, or regional, or nation-wide in scope, are working together, and it augurs well for the future of agriculture that the farm organizations are working together now. They have differed in times past, but surely at the present time there is a happier relationship among the farm groups than ever before. I am very glad to have been here and to have spoken to you and

to have brought a short message on the legislation situation at Washington, knowing that as these questions relate to you in your Maryland Federation, and as we ask you from Washington to become active, the happiest and most enthusiastic response will come through as it comes from all the other States and Farm Bureau Federations over the nation.

CHAIRMAN NUTTLE: We certainly appreciate your coming here and addressing us. The meeting is adjourned.

The meeting adjourned at five-ten o'clock.

Adjournment.

FRIDAY MORNING

January 6, 1933

The third session convened at 10 o'clock, Mr. E. P. Cohill, first president of the Maryland Farm Bureau Federation, presiding.

CHAIRMAN E. P. COHILL: It certainly gives me great pleasure to be with you again this morning. We are late in starting, so I will just ask Dr. Pearson to give us his address, "Significant Developments Opposing Co-operative Efforts Among Farmers." Dr. Pearson, president of the University of Maryland.

DR. R. A. PEARSON: Mr. Chairman, Ladies and Gentlemen: This is the "morning after," and only those who are interested, and very much interested, are here. I am highly flattered to see so many in the room.

According to my watch my address was finished fifteen minutes ago. I am going to talk to you only a short time, and very earnestly, about some of the significant things in the co-operative movement. There is a little town out in the Middle West, I know it fairly well, it is not in the State that I came from when I came here; it has a small popula-

tion, and it has a characteristic small town newspaper. There are a few people we would say who have vested interests, who have connections, in that town. I don't know how much of it they own, but they have some influence with the editor of that newspaper, and those people are opposed to co-operative efforts among farmers. Long since did they move away from that little town. Their interests are elsewhere, but their influence back there has continued.

With this result—that from time to time there appears in that little paper a very vehement condemnation of anything and everything that relates to farmers' co-operation, and it is usually signed by a farmer. He doesn't write very far in his article before he lets it be known that he is a farmer, and he is against the Farm Board, he is against the extension work, he is against the agricultural college, he is against the local co-operative, he is against the State movement which represents a lot of local co-operatives, and he makes a plausible little story, well written. A little later another one comes out, and then what happens? This little dinky local rural paper, which is entitled to a circulation of about 400 copies, runs off an issue of five, ten, or fifteen thousand copies. They are paid for by interests that want to see that kind of stuff printed and circulated, and then they are mailed all over this country, and I know a man who received some of that stuff over in Europe. I presume some of you have received that little paper.

Now, that I call a significant movement in connection with co-operation. It is very significant, and it is very much against the farmers' co-operation.

Here is another instance. I happen to know about this because of my position. Not very long ago a group of people, able folks, good citizens, many of them very fine folks, I am sure, got out a long letter and sent it to the presidents of, I think, every important university and college in the United States. I noticed President Ames of Johns Hopkins was one of those addressed, the president of the

University of Maryland was another, and there were some two or three hundred of them. They are all down there, their names and addresses, and then followed the letter. The letter ostensibly is a sincere attack on the Farm Board. It seems as though that letter was gotten up with great care, and no mistake ever made by the Farm Board has ever been overlooked. These presidents of educational institutions are asked which way is America going. The whole text of the letter indicates that she is going downward because of these co-operative efforts being made by farmers. That is item No. 2.

Then there are certain classes of people, and they are located pretty much everywhere, who just love to find your mistakes and mine and play them up and do what they can, to undermine these efforts that are being made in the interests of co-operation, and I think everybody in this room is acquainted with some people of that type. Some of them are your good friends on about every subject but this one.

Now, folks, what is this opposition based upon?

Well, I will tell you. The opposition is based upon a misunderstanding of agriculture. We can all be fair, and we can all be charitable. There are lots of people who simply don't understand agriculture. A professional man said to me not so very long ago, "Why is it that the farmers of this country are demanding a special kind of credit. My goodness, this country is more than a hundred years old, and we have been able to get along with the credit that we have, and here is a bunch of farmers' organizations coming along demanding special credit. What do they want to do that for? You know, don't you, that the great volume of credit that is extended by the banks is on the basis of 30 to 60 and sometimes 90 days?"

I said, "That has been built up as an accommodation to those who borrow at the bank, buy goods, and sell those goods, and then with the money they collect go and pay the

money to the bank. The merchants know whether it is going to take 30, 60, or 90 days to complete their operations, and borrow accordingly. What good will it do if you loan a farmer money for three months or two months, who is going to develop a flock of sheep? The sheep won't be any more than just started when the note would be due and the bank might call it. The man might be ruined. He would have to go and get another loan."

He said, "I never thought of that."

I said, "When a man borrows money to enable him to raise a crop of wheat, he cannot handle that as a merchant who is going to buy an order of shoes and sell them again."

He said, "I never thought of that, and I am glad you told me, and I am for it."

There are literally millions of people in this country who are opposing farmers' co-operation because of the same type of ignorance that this man, generally well informed, showed that day.

The people are waking up. This thing came to my attention just a few days ago. It is a little strong for the colleges, but it applies to co-operation, too, and I must read it to you. It is a part of a speech of Congressman La Guardia of New York. He was not re-elected, but he is one of the lame ducks, and he is down there now, and some times he says some awfully good things. The Agricultural Department appropriation bill was under consideration, and he said:

"Mr. Speaker, the important question is the continuing of study to correct the defects of nature." (Somebody on the floor, also from New York City it happened, wanted to cut some appropriations for scientific work in the Department.) "The important question is continuing of study to correct the defects of nature. The most fascinating part of human activity is its constant combat with nature in fighting the elements and in correcting the defects. This has

engaged the attention of mankind from the earliest times. Assuming, if you please, that we now have over-production and production of more commodities than the people of the country have ability to purchase, that is no justification for closing the doors of these laboratories, closing the doors to scientific research, and stopping it. We must continue it. The population is increasing. Some day the legislative branch of government will keep abreast of science. Why, Mr. Chairman"— (This must have hit some of them like a poison dart) "the most humble research scientist in the Department of Agriculture at this time is contributing more to this country's welfare than the most useful member of Congress."

I didn't say that. I wouldn't say it in public, and I don't know if I would in private, but a member of Congress said it. He is very well informed on it too. He continued, "The most humble engineer in the General Electric laboratories, in the Radio Corporation of America, is more useful to America than the most brilliant orator in this House." (There is an indication of a little change in the tide. Now get this, this is good.) "The trouble is that the legislative branch of government has not kept abreast with science, government has lagged while science has advanced. We have permitted an unbalanced system of distribution to continue while science has increased production. We are living in a paradoxical state where there is great over-production on the one hand, and want and misery on the other. That is not the fault of science; it is the fault of government. This is the fault of the men who have control of the government affairs of the country."

Well, that happens to relate to the Science Department of Agriculture, it applies to science in colleges, it applies to every advanced move that is being made by farmers through their organizations. Reading things like that ought to encourage us all to go on and try the harder to work out these great fundamental truths and facts that may be applied to our business.

Well, the opposition is based upon private interests, and frankly we have a good deal of sympathy for some of those private interests. I think a policy generally in this country is not to develop a co-operative organization if matters are being fairly well cared for by private interests. That is what I have always advised. But whenever a matter is not being cared for properly by private interests, what else is there for the farmers to do? Why is it that the Standard Oil Company takes the oil from the ground and sells it to you and me to put into our cars? Because they feel they can do it better from a number of standpoints than to have that oil pass through the hands of that and the other group where misunderstandings might develop and difficulties arise.

Then these misunderstandings are due to jealousies, too. There are some folks who have been recognized as leaders so long that it just naturally kind of hurts them to have a big farm leader, let us say, or a big leader of any other kind who is new on the scene appear and share the limelight with them.

And then the opposition is based too often upon a pretense to reduce taxes. The department of extension out in Iowa, you know the situation is very serious out there, and there arose a clamor to cut out the extension work. They said that was one of the things that was bearing them down. It started and went like wild fire all over the State. Very quietly they got the figures together and began to study the matter with the aid of leading farmers who had not lost their heads, and they found that the average farm was paying in a year something like $215 in taxes, of which 32 cents went towards the extension work. And when that fact was brought out there was no more argument, no more speeches against extension work, which is needed there now more than it was ever needed since it was started.

In every case the opposition would be voluntarily reversed to support, or forcibly overcome in some cases, if the truth

were known. That is what I am trying to say. The public is not informed as to what co-operation in agriculture means. Some are a little informed; they are more or less active and effective in promoting it. But too many of them for these four reasons I have mentioned are indifferent, or actively opposed to it.

Well, we have had some pretty good developments in co-operation here in the last year or two. It is just coming along here in Maryland. Look at our Maryland Dairymen's Association. See what it has done. It has put money into the hands of the producer and the consumers say, "Yes, at our expense." No. It has given the consumers a high and reliable and splendid quality of that most important of all goods. They have all benefited, and I cannot say too much in praise of leadership in an organization that will bring about a result like that, one of the rare instances of most effective leadership in this country.

We have our tobacco association, which has done splendid work, and we have now a new livestock association. Co-operation in Maryland is moving forward. The greatest force in this country that is promoting co-operation among farmers is the Federal Farm Board. Here is their report. I wish you would all get it. I think you have to buy it from the Government Printer. Ten cents is the price—get it from the Superintendent of Documents, Washington, D. C. It is the third annual report of the Federal Farm Board. Read that and you will get a thrill. You will learn what is being done now in promoting co-operation in connection with dairy products, poultry, tobacco, seed, fruit, cotton, I don't know how many other things. And you will find that the gross value of agricultural products put on the market last year was a little over five billion dollars, and two billion of it went through farmers' co-operatives, 40 per cent. You know those figures; you have heard them before. One little figure. There are 1,400 associations now in connection with fruit, and vegetables, and nuts, having 198,000

members. Isn't that wonderful? Agricultural co-operation progress.

Now, why should it be further strengthened? Because united you stand and divided you fall, and separate units are not effective. They are subject to the whims of this, that, and the other person. Look at the labor unions. Why did they organize? Look at a department store, the chain stores. I will take a minute to tell you this, which I learned personally in studying the dairy industry of Switzerland a good many years ago. The farmers over there were depressed and discouraged. They could not get a good price for their milk, and why was it? To make a long story short, they got some experts on the subject and they began to study it. Their agricultural college over there was working with them.

Finally they sent a committee over to London to find out why it was that Swiss cheese exported from the country was in about as low a position as any cheese on the London market. Their committee came back with their heads down. They came back and told their fellow-farmers in Switzerland that there was just one reason why the Swiss cheese was selling at the lowest price on the London market, and that was that it was not good cheese. They turned that over to the experts and said, "Find out why we are not making good cheese and correct it." They said the State would help them do it.

So they got busy, and in not a very long time the Swiss cheese was bringing the highest price on the London market, and when that which was the outlet, the overflow, was raised to the high price, all of the milk consumed at home was raised to the high price, and the dairy farmers in Switzerland changed from depressed farmers to a prosperous condition through co-operatives.

But why do we want to keep agriculture up on a higher level? Well, for the benefit of the farmers who are in it. That is one good reason. But another good reason is simply

this, that in the course of time the character of the farmers determines the character of the cities. You know cities are not self-maintaining. If you build a fence around a city and do not allow new fresh blood to come in from the country, the city would deteriorate very rapidly. The cities are made by the rural districts, and if the rural districts are to be permitted to fall to the low level that will work itself into the cities, too. You know what it will do to the nation.

I have studied co-operation and agriculture as found in Russia. Many of the farmers there cannot read or write. In Moscow they have a building as big as the Lord Baltimore Hotel, about a third as high, which contains the offices of the agricultural co-operatives, and there they are coming in literally by thousands with reports from Russian farmers, all of that territory, and clerks are working them up so that those Russian farmers will be informed if they don't have the ability to do it themselves, to be informed as to what part of their work was giving them a profit, and what part was giving them a loss. Thus they could be advised as to better methods of developing their farms. There are great co-operatives in Russia among those ignorant people, and when the Russian government fell, and their governing officers fell with it, and their local government bodies did not have the power or the courage to act, there was quite a long period when the Russian co-operatives were the only things organized in Russia that were worthy of mention, and holding that country together. I am pointing that out as evidence of what co-operatives mean to a nation.

I will tell you one good reason why we do need them here, and that is that co-operation is teaching us to work together. Co-operation means getting together, this man yielding a little, that one yielding a little, the other one yielding a little, until by and by a harmonious whole is developed, and the whole crowd can march together with that as their ideal and an expression of their ambition. We have got to co-operate. Somebody has got to yield to the

judgment of another, and it takes a big man to do that. Co-operation is helping us to grow bigger in that way, and stronger. I have tried to mention a few of the outstanding developments in co-operation.

CHAIRMAN COHILL: The next thing is the roll call of voting delegates.

Roll call.

CHAIRMAN COHILL: The next in order is the report of the Committee on Constitutional Amendments. The secretary will read that.

SECRETARY FAIRBANK: We the Committee on Constitutional Amendments recommend the following:

"That Section 1, Article 3, headed 'Requirements for Membership,' be amended to read as follows: 'Any County Farm Bureau or similar organization in the State of Maryland having minimum membership dues of five dollars ($5.00) per year shall be eligible to membership in the Maryland Agriculture Society—The Maryland Farm Bureau Federation.' "

I move the adoption of this amendment.

Seconded by Mr. Jones and carried with one dissenting vote.

MR. COCKEY: I would like to explain my vote. We have had that question up in the Baltimore County Farm Bureau repeatedly, and our board has voted that they are not in favor of reducing the dues. Therefore, I vote no.

MR. HARRY: This doesn't mean a county cannot have $10.00 dues if they want to, does it? But if they have a minimum of $5.00 they are eligible. Am I right?

SECRETARY FAIRBANK: That's right, the minimum membership dues will be $5.00.

CHAIRMAN COHILL: Yes. If Baltimore County wants to have theirs $10.00, it is all right.

MR. COCKEY: I don't think Baltimore County would care to be the only county that had $10.00 dues. It is going to cramp our style very much in Baltimore County to get along on $5.00, but we are perfectly willing to go along with the majority always.

Mr. Chairman, I would like to vote that we make this vote unanimous.

Done.

SECRETARY FAIRBANK: That Sub-section A, Section 1, Article 3, be amended to read as follows: "The membership of the said County Farm Bureau or similar organization shall be composed of not less than fifty (50) persons who own or operate farms or whose annual occupation is farming." We have changed the wording from 100 to 50.

I move its adoption.

Seconded and carried unanimously.

SECRETARY FAIRBANK: That Section 1, Article 9, headed "Finances" be amended to read as follows: "Collections of State and National dues to be forwarded monthly. Each county organization affiliated with the Maryland Farm Bureau Federation, shall forward to the Treasurer of the State organization, not later than the seventh day of each month, all State and National dues collected by the county organization during the preceding month. The total of these State and National dues per individual member shall be two dollars ($2.00) per year, of which fifty cents (.50) shall be for one year's dues to the American Farm Bureau Federation."

The change there is reducing the State dues from $4.00 to $2.00 and leaving out the 50 cents for the Farm Bureau Co-operative, which we don't publish now. The $2.00 is 40 per cent of $5.00, so that the proportion between State and counties is the same as it was under the old ruling.

I move its adoption.

Seconded and carried unanimously.

Question from delegate: Is this change to go into effect immediately or at the expiration of present paid-up dues?

SECRETARY FAIRBANK: The committee felt that this should go into effect immediately, and that at the next Board of Directors meeting some provision should be made for extending the paid-up dues of those members who have paid in recently on the $10.00 basis. But that was not part of the constitutional amendment. That really should not go into the constitution. That action is to be left up to the Board of Directors immediately upon convening. According to the constitution, all amendments go into effect upon their adoption.

I move the adoption of the report as a whole.

Seconded and carried unanimously.

MR. SNADER: In changing the membership from 100 to 50, how many delegates are we entitled to?

SECRETARY FAIRBANK: The committee did not write that into the amendment, although they discussed it. Right now the constitution reads that delegates from the county organizations are entitled to two voting delegates for each 100 members in good standing or multiple thereof. That has always been interpreted to mean one voting delegate for each 50 members or multiple thereof. If you have 50 delegates you are entitled to one delegate. In my personal opinion that ought to be clarified a little bit. I don't know whether you want to take action on that in view of what we have said here or not. You could clarify it if you wanted to by making it read "shall be entitled to one voting delegate to the annual or special conventions to each 50 members or multiple thereof."

MR. NUTTLE: I move we do that in that report.

SECRETARY FAIRBANK: To amend Article 4, Section 1, to read, "be entitled to one voting delegate to the annual or special convention for every 50 members in good standing, or multiple thereof."

Seconded by Mr. Snader.

MRS. WILLIAMS: Don't you believe every county is benefited by having more delegates than less. You put your minimum membership at 50. Would it be better to have two delegates for every 50? Then each county would have two men or women here who felt it their duty to come in preference to the one, and they would feel much more responsible, and maybe one could take something back from the convention the other didn't get.

SECRETARY FAIRBANK: My own personal reaction is that since the counties pay the expenses of the delegates to the convention, that might work a hardship on some counties like Mr. Cockey's. He is going to have an awful hard time getting along now. However, it has been the practice of those counties that wanted to send more delegates to do so under present constitution by giving each one of them a half vote. So that really takes care of it. They might even send four and each have a quarter vote.

MR. HARRY: What is the multiple of 50 considered to be?

SECRETARY FAIRBANK: It usually means 26.

MR. ANDERSON: Would this be the proper time to stress the matter of membership?

CHAIRMAN COHILL: We will take that up a little later, if you please.

MR. ANDERSON: Since we have reduced the dues to $5 from $10, I think we ought to make special efforts to get two members where we had but one before.

CHAIRMAN COHILL: That comes up under organization.

We are ready for the report of the Resolutions Committee. Mr. Weagley is the chairman.

MR. WEAGLEY: I would like to say before I read this report that the Resolutions Committee usually has a long

report, but as soon as Mr. Fairbank announced I was to be chairman of the committee I realized it would be short, because I am short. So we have a very short report, which won't take long to read.

This report has been signed by four of us, including myself, Mr. Brooks, Mr. Foley, and Mr. Warfield. At this time I am going to ask Mr. Warfield to make a statement.

MR. WARFIELD: As a member of the Resolutions Committee I signed the report which includes an endorsement in toto of the Tax Committee's report. There is one provision of that that I wanted to take exception to. I wanted to sign this Resolutions Committee report because I believe in all except this one provision. I think they are sound. I think the work of the Tax Committee is excellent and is to be highly commended. I think they have gone into the tax problem soundly and thoroughly, and have conceived of a program which, with one exception which I will mention, should have the unqualified support of our organization and the entire State.

The provision I take exception to is the last provision of the report, which is as follows: "We have considered carefully the recommendation of the Tax Survey Commission to levy a 10 per cent tax on pari-mutual betting. After considering the minority report of that Commission, and the fact that agriculture benefits indirectly but in a very substantial manner from the development of the racing industry in Maryland, we are reluctant to endorse this proposal in full. We do feel, however, that a tax not to exceed 5 per cent could be paid on the pari-mutual winnings of our race tracks and yet not place them in a disadvantageous position as compared to the tracks of other States. Revenue from this source we feel should be used to reduce the State tax rate."

So I won't be accused of having a special bias in opposing this because I happen to be a member of the State Racing Commission, I want to say that my interest in racing in

the State is not as a racing man. I am a farmer first and foremost, and my interest on the Commission is to see that the institution of racing brings as much benefit as possible to the State of Maryland directly and indirectly.

In the first place, I think it is extremely dangerous to levy an additional tax on the tracks in any way, shape or form at this time. I think you run a grave risk of killing the goose that lays the golden egg. I think it ought to be brought out that the racing industry is already paying to the State at this time, the tracks are paying $6,000 a day for every day they have racing, and in the case of Pimlico they are paying $9,000 a day. They are paying 15 per cent of their net revenues, and in addition to that through the charity days they have put on they have paid into the charity funds of the State over $100,000 a year, and last year around $125,000. So that the State this year is getting, including the charity, over $600,000 in revenue. That is, of course, aside from the large property taxes paid to the counties where the tracks are located, and aside from the admission tax which is paid to the Federal Government.

The revenues of the tracks have fallen off very substantially this year. The betting from which the revenue is derived has decreased very materially during the last two years, and very materially this year, without any tax being levied on it. On the present basis of the four mile racing associations, one of them has gone very heavily into the red, and the other three have made only very moderate profits this year. It has been necessary in order to keep the budgets of the tracks balanced for this next year to heavily cut purses paid to owners of winning horses, to cut wages and salaries all the way down the line, and I don't think any one, whether he is a tax expert or not, can forecast what next year may bring to the track.

I think it would be extremely dangerous to impose a 5 per cent tax as recommended in this report and run the risk of diminishing the aggregate revenue you are receiving today. At the same time, to put the tracks in a position

where they have to pinch and pare still further, to the detriment of the breeding industry of the State. I want to say a word on that, because that is a particular interest of mine in this racing institution. In the past a large proportion of the horses which raced on Maryland tracks have been bred out of the State—in Kentucky, in Virginia, in New York, and other States, but in recent years there has been the beginning of a substantial breeding industry here in the State. That means a market for our farms, usually at good prices, because men who have interests in breeding race horses are usually men who start off with some means. They don't always keep it, though. But it does bring people into the State and it brings people out to buy our farms who have the means to pay good prices for them, and possibly brings taxable resources into the State.

We are just on the threshold of developing that industry here in Maryland. It has already reached a large proportion, but only a small proportion of the horses racing on our tracks are bred here. But with the encouragement of the Commission and the co-operation of the tracks, in the last few years they have been putting on an increasing number of races limited to Maryland bred horses, and in addition there is a $250 premium paid to the breeder of any winning horse bred in Maryland. The tracks are willing and the Commission is urging the increase in the number of those races as fast as horses are being bred to fill them.

I think in these days when there is too much food being produced apparently for consumptive requirements, and farms are a drug on the market, if we here in Maryland can develop a new market for our farms and can take them out of the production of foodstuffs and milk and into the production of horses, it is of direct benefit to the agricultural interests of the State. The more you bear down on the tracks and reduce the revenues from which they pay these purses, the more they have to cut in purses and in the amount of money available to be paid to breeders in Maryland.

I think that racing has such a direct agricultural interest I would regret exceedingly to see an agricultural organization pounce down upon the racing industry as a source of revenue, that I am firmly convinced it will not be for the coming years, and in the effort to get it you may seriously cripple the industry. That is about the picture as I see it, and for that reason I don't feel I could sign the report in full.

MR. HARRY: Mr. Chairman, I would like to say relative to that paragraph in our tax report in reference to it that it reads "a tax not to exceed 5 per cent." That might mean one-half of one per cent, which we have in some of our Federal laws. It could easily be 1 or 2 per cent, because it says not to exceed 5 per cent. I don't believe any one winning a five-dollar bill on a two-dollar bet would object to paying five or ten cents of that to help the poor farmers and to relieve the amount of money in the right-hand corner of the tax bill.

MR. WARFIELD: I might make one further observation, that these bettors, large bettors, are very sensitive to what they call the "take" taken out of the bet. We find that on charity days when the commission which is normally 5 per cent plus what they call breakage, which amounts to a tenth of one per cent, that has been increased to as much as 8 per cent, which is an increase of a little over 2 per cent, the betting has fallen off very materially, which would indicate if that same ratio of decline in betting would carry right through the year, that it would be disastrous to the revenues of the tracks and to the State.

This report refers to the fact that we would not be at a disadvantage as compared with other States if we had a tax as much as 5 per cent, which would be on top of the "take" and would make a total of about 10.8 per cent. Maryland, and I can say it freely without any embarrassment because I haven't contributed much to the industry of racing, but it is head and shoulders above other States

in the character of the racing we have here. In New Orleans, where they have a track and take 10 per cent, their revenues are so greatly decreased this year they had to throw open the gates and not charge admission. In Kentucky, where they have 8 per cent "take," I think, the racing is not nearly so good or on such a sound basis as here in Maryland.

Then you must consider that where they have those 8 and 10 per cent "takes" the tracks are not required to pay a $4,000 license fee which they pay in Maryland. That comes out of the racing revenue. I don't say a tax of 1 or 2 per cent couldn't be placed on racing; I would not say that would be disastrous, but when you do that at a time when revenues are so rapidly decreasing and we don't know when we are going to strike bottom, to accelerate that by putting even a small tax on is a serious and short-sighted policy from the standpoint of the State, particularly when the amount that could be raised would not be very large and would not solve your tax problem, but would be just sort of a side issue with you, relying on other sources to produce the main amount of revenue. I think it is a dangerous step.

MR. NUTTLE: I hesitate to rise, and yet my name is signed at the bottom of that Tax Committee report. There is a big element in this State of Maryland who would prefer that we didn't have any betting and horse racing in the State. I remember when I was at Annapolis how they emphasized the value to the State of this horse breeding, and so on. I am glad to learn from Mr. Warfield that they really have done something along that line. It used to be used as camouflage when we had the race track fight in Annapolis.

I feel personally that some of those fellows have more money to pay taxes on than some of us farmers do. As long as it is entrenched in the State as it is, I signed that report. I don't think we can get it out under these times.

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But I want to emphasize the fact that a bunch of us people would rather we didn't have any race tracks at all.

MR. WEAGLEY: I will give the report of the Resolutions Committee.

"We approve the resolutions adopted at the Fourteenth Annual Convention of the American Farm Bureau Federation in Chicago December 7, 1932."

I move the adoption of the resolution.

Seconded.

MR. HARRY: How can we vote on that unless we know what the resolutions are? I have no idea what they adopted.

MR. WEAGLEY: It has been published. I think it would have been well to have copies of the resolutions passed around. The committee may know, but the rest of you do not know what they voted for.

MR. HARRY: I can't vote for something I don't know anything about.

Secretary Fairbank read the resolutions.

MR. NUTTLE: I am not ready to support all of those things. I may be ignorant on a lot of that stuff, but I think we ought to take them up and vote on them and adopt them or reject them. I move we take up the main items in those resolutions one by one and vote on them.

MR. HARRY: I agree with Mr. Nuttle, but it is almost 12 o'clock and we won't have time to discuss them. I feel like Mrs. Williams does. If we are going to get anything out of these meetings we ought to have time arranged so we can discuss the things we want to take back to our Farm Bureau members in the counties, and not come here and adopt something that was done in Chicago and not know why it was done. There are some things there I am not in favor of without more information on them at least, but I don't believe we will have time to do it this morning.

PRESIDENT MASSEY: Mr. Chairman, I think it is a very good idea to have these resolutions read, but it has been the custom for years to reaffirm the national resolutions. The resolutions we are going to adopt here today, most of them, come from the counties. The resolutions adopted at the convention in Chicago have come from the States, and the States were represented, and they were all thoroughly discussed pro and con before we adopted them. I think it would be a very good thing to go over them and understand them, but I think we ought to be very careful not to turn down any of these resolutions adopted there unless we know what we are doing.

CHAIRMAN COHILL: I know how hard it is to get a director in the national organization. Maryland has been favored. Understand, we have a director from the Maryland Farm Bureau Federation representing this whole part of the South. Our director was there when these resolutions were passed. Any action we take here is going to go back to Chicago. I don't think there is anything so very wrong about these resolutions. But it is going to reflect on Maryland when the Maryland delegate goes to the national board meetings. We have been favored. I was the first, Mr. Davis and Mr. Massey right in line, representing the whole South. I just want to give you that as a suggestion.

MR. ANDERSON: Would it not be well to refer discussion of these resolutions to the Joint Tax Committee?

SECRETARY FAIRBANK: The Tax Committee has nothing to do with these resolutions.

MRS. WILLIAMS: I want to say I am a Farm Bureau member 100 per cent, and I don't agree with everything that goes on in our directors' meetings, and I don't agree with everything that is passed here, but we have to just do the best we can and take our part up somewhere else. The State is not going to turn down any of those resolutions passed by the National Farm Bureau, surely they are not,

and yet they may not agree thoroughly with them. They can explain their position. I'll bet there isn't a man who agrees 100 per cent with the other half of the house, but he doesn't say it.

CHAIRMAN COHILL: That is the idea; we want to do a little co-operating.

MR. NUTTLE: I will withdraw my motion.

The motion to adopt the resolution was put and carried unanimously.

MR. WEAGLEY: No. 2. We recommend the approval of the report of the Tax Committee of the Maryland Farm Bureau Federation, especially recommending the following: Under A, the committee's co-operation with the State Grange Tax Committee. B, that portion of the report that points out the absolute need for economy and reduced cost of government as outlined on pages 6-7 of the report. C, the enactment of a State income tax law as outlined on pages 3-4-15. D, enactment of an emergency revenue act on certain businesses and professions such as will be the least objectionable to the farmers of Maryland, and as outlined on page 14. And we recommend a continuance of the Tax Committee until the next annual convention in order that the recommendations of this report may be carried out."

I move its adoption.

Seconded by Mr. Jones and carried unanimously.

MR. WEAGLEY: No. 3. "Owing to the increase in poultry stealing in a number of the counties in which it is the practice of holding these thieves for the action of the Grand Jury and thereby incurring unnecessary expense to the county, we urge the enactment of such legislation as will permit these thieves to be tried before a local police magistrate, and in view of the light sentences generally imposed which seem to have no deterring effect on this practice, we

urge the enactment of legislation pertaining to the use of the whipping post as a penalty.

I move its adoption.

Seconded by Mr. Cockey.

MR. CARROLL LOWE: I would like to second that. I notice quite a little levity on the part of the people here, but it isn't funny. That resolution comes originally from my home town, and I can see that as soon as we adopt that resolution the press of the State is going to refer to the Eastern Shore again as going back to barbarism. I would like to challenge anybody to treat that matter lightly, when on the farm you raise a crop of turkeys or chickens and get them up to the point where they are ready to market, or to the point of laying, and some morning find them all moved out. The man who finds that feels like using the shotgun instead of the whipping post, and I don't believe any jury would convict him of criminal intent. I believe he would be fully justified, and I personally wouldn't hesitate to do it, and take the consequences. It is getting to be a serious matter. Our State authorities either can't or don't apprehend the criminal. It is a rather difficult matter. I understand such laws are in effect in Delaware, and one or two applications of that has more deterring effect than all the sentences that can be imposed. We have witnessed time after time in the courts thieves that we were practically certain had stolen poultry would get off on some technicality. It is a serious matter.

CHAIRMAN COHILL: I would like to see fruit added to that. They come into our orchards with trucks and haul the apples and peaches away.

The motion was put and the resolution adopted unanimously.

MR. WEAGLEY: We oppose any legislation that requires the general re-registration of all automobile drivers, but we

favor the rigid enforcement of the automobile law against the reckless and incompetent driver.

I move its adoption.

Seconded by Mr. Snader and carried unanimously.

MR. WEAGLEY: No. 5. *"Whereas,* there is a distinct movement on the part of growers of cantaloupes and other interests, pears especially, on the Eastern Shore to protect the industry from unscrupulous marketing of immature fruit, and

"Whereas, such a measure has been prepared and endorsed by the members to aid this industry, and

"Whereas, there is a need in this State for legislation providing for the grading and marketing of all fruits and vegetables similar to the provision of the present apple law; therefore be it

"Resolved, That the State Farm Bureau endorse legislation for the protection of the cantaloupe industry as well as to provide broader legislation for the grading and marketing of all fruits and vegetables offered for sale on our markets."

Seconded by Mr. Cockey and carried unanimously.

MR. WEAGLEY: No. 6. "Resolution of appreciation. To the management of the Lord Baltimore Hotel we desire to express our most sincere appreciation for the many favors extended us during the entire convention. To the Honorable Governor we express our appreciation for being honored by his presence. To the Mayor of Baltimore we are grateful for his co-operative spirit. To *The Sun,* the May Company and the Century Theatre we express our appreciation for the courtesies extended to the Farm Bureau during the convention. To the Police Department of Baltimore we are very grateful for their courtesies during the convention. To the press of Baltimore City and the counties we extend our appreciation for the fair and generous man-

ner in which they have given publicity to our various activities."

I move its adoption.

Seconded and carried unanimously.

MR. WEAGLEY: I move the adoption of the report as a whole.

Seconded and carried unanimously.

CHAIRMAN COHILL: The next in order is the report of the Nominating Committee and the election of officers.

MR. MASSEY: It gives me great pleasure to make this report. "The Board of Directors of the Maryland Agricultural Society, the Maryland Farm Bureau Federation sitting as a Nominating Committee, have cast their unanimous ballot for the nomination of Charles T. Cockey, Jr., president of the Baltimore County Farm Bureau, as president of the Maryland Farm Bureau Federation, and Harry H. Nuttle, president of the Caroline County Farm Bureau, as vice-president of the Maryland Farm Bureau Federation."

I move the acceptance of the report, and move that the secretary cast the ballot of the convention for these two gentlemen.

CHAIRMAN COHILL: Are there any other nominations?

MR. BOLEY: I nominate Mr. Massey.

MR. ENSOR: I rise to a point of order. Does a nomination not have to come from a director or a voting delegate?

CHAIRMAN COHILL: Are you a voting delegate, Mr. Boley? if not, your delegate to the convention, your director is Mr. Lowe.

SECRETARY: You wouldn't be permitted to make nominations.

MR. BOLEY: I would like to hear that section read.

SECRETARY FAIRBANK: "Election of President and Vice-President. Section 2, Article 8. The President and Vice-President shall be nominated by the Board of Directors and elected at the annual meeting by the authorized delegates and directors representing the affiliated organizations."

CHAIRMAN COHILL: I remember it used to be different. Nominations from the floor were in order.

MR. HOLSINGER: If you will follow that up, I think you will find that is taken care of a little later.

SECRETARY FAIRBANK: Not in this copy.

MR. HARRY: Does that section prohibit other nominations?

SECRETARY FAIRBANK: I don't see any provision in here for nominations from the floor.

MR. HARRY: I am just rising for information. In case there was dissention in the Board of Directors and no nominations, there couldn't be any election. In other words, the directors have all the power. It is different from other organizations.

CHAIRMAN COHILL: It seems so. It is different from the way it used to be back in olden times.

MR. BROOKS: It seems to me we should make provisions for nominations from the floor, if it doesn't exist at this time, because this body might become a closed corporation, and it doesn't seem a fair way of electing. All other bodies have the privilege of nominating from the floor.

SECRETARY FAIRBANK: Here it is limited to the authorized directors.

CHAIRMAN COHILL: I think that requires an amendment to the present constitution, and I think we are authorized to do that right here.

MR. BROOKS: I move that amendment be made.

Seconded by Mr. Snader.

CHAIRMAN COHILL: There is a motion before the house.

MR. HARRY: I want to make it plain I am not opposing the recommendation made by the Board of Directors, but if we don't have a thing of this kind corrected, we might as well have both the nominations and election restricted to the Board of Directors.

CHAIRMAN COHILL: We are in a snarl, all right. We have a motion before the house, and an amendment which is entirely different from that motion. We had better go ahead.

MR. BOLEY: Can a voting delegate make a nomination?

SECRETARY FAIRBANK: I don't see why they can't. May I give my interpretation of this paragraph. The president and vice-president shall be nominated by the Board of Directors and elected at the annual meeting by the authorized delegates and directors representing the affiliated organizations. "Affiliated organizations" means all the counties and other organizations. My interpretation would be that nominations could be made from the floor. I think it has always been understood that they could, provided, of course, it was made by an authorized delegate or director. Of course, the directors have already passed their opinions, so it would be limited to the delegates. No one other than a delegate could make a nomination. I am quite sure that was the spirit in which it was written.

CHAIRMAN COHILL: I know it was.

MR. COCKEY: It has always been understood that in case there should be a nomination from the floor it would always be accepted. The directors and delegates are here to transact business for the organization, and I think they ought to be allowed to nominate any one they want. We have always agreed in the board to that effect.

MR. ENSOR: In order to clear this matter up, I will make

a motion that the body be given the right to make nominations from the floor, and that we take a vote on that, the delegates and directors.

Seconded by Mr. Cockey.

MR. MASSEY: I will withdraw my motion about the adoption of the report.

The motion was put and carried unanimously.

MR. ENSOR: Mr. Massey withdrew his motion. I think he will have to repeat the motion.

MR. MASSEY: I am just reporting for the Board.

MR. SNADER: I move the nominations be closed.

Seconded by Mr. Jones and carried unanimously.

SECRETARY FAIRBANK: I hereby cast the unanimous ballot of the Board of Directors and the voting delegates of the Maryland Farm Bureau Federation assembled January 6, 1933, for Charles T. Cockey, Jr., as president, and Mr. Harry H. Nuttle as vice-president.

PRESIDENT-ELECT COCKEY: Mr. Chairman, Ladies and Gentlemen: It seems from the applause that I have quite a number of friends here today, but as time goes on I hope I will not be like the umpire of a game of baseball. Before the game started everybody on the field was his friend, and after the game was over he made so many errors on both sides that he didn't have a friend on the field.

This is an honor. It is the greatest honor that has ever been conferred on me, and I hope by your help, your co-operation, that we may have a successful continuation to carry on the duties and the benefits accruing from the activities of this Farm Bureau organization. I regard myself only in the light of a servant. The Board of Directors, according to our constitution, is the controlling element of our organization. They direct the affairs, how they shall be conducted, and it is the duty, according to my judgment, of the presiding officer, to see that their orders are carried out. If you have elected me with any idea that you have

a man who can get up on his feet and talk, you have made a great mistake. You found that out already, no doubt. But if you have elected me to work for you, then I pledge you my very best and wholehearted endeavor to carry out your orders.

CHAIRMAN COHILL: Mr. Nuttle, what have you got to say about it?

MR. NUTTLE: I can't understand why you fellows wished this on me. I wasn't present when the Board of Directors made the nominations for vice-president, and knew nothing about it until afterwards. I had to preside here yesterday afternoon, and I find they put me up as vice-president, and it nearly had me floored. I feel utterly unable to fill the shoes of those who have gone before; I feel very insignificant, and feel that you fellows will just have to hold us up all you can. That is the only way we will get anywhere, working together, and bearing with each other. I hope and pray we may have a good year and years together. Like Mr. Cockey, I am just the hired man, that is all.

CHAIRMAN COHILL: The next is organization plans. Did you want to talk on that, Mr. Anderson?

MR. ANDERSON: Yes, but I can't hold one thought too long. I merely wanted it emphasized before we left here that it is important to increase our membership. Of course, we have always had this problem before us, but it is more of a problem now than it ever was. It becomes a real necessity at this time. It has passed beyond the problem stage. Of course, we are always looking for numbers in our organization. The farm organization needs numbers, in fact, all organizations do, because by numbers we get influence. I would just like to have it stressed, not only by myself but by others, that since we are going into the $5.00 membership idea, let each one here do his level best to get at least one member more, so we will have two for the $10.00 we used to pay.

This is not a job to be imposed on just a few. I would suggest, and earnestly urge each Farm Bureau member here to work toward increasing the membership, to do his best to get his neighbor to come into the Farm Bureau. Let's make this influence far reaching.

CHAIRMAN COHILL: I find we have overlooked the report of the Auditing Committee.

Mr. Nuttle gave the report of the Auditing Committee. (See treasurer's report, page 30.)

MR. NUTTLE: I move approval of this report.

Seconded by Mr. Jones and carried unanimously.

DR. SYMONS: Mr. President, I rise for the privilege of presenting on behalf of every delegate and representative present, I am sure, every Farm Bureau member as well who has attended this convention, to extend our heart-felt appreciation of the services of our retiring vice-president and president, Mr. Massey, who has served the organization through storm and calm, and I know that we all are glad to give expression to our warm appreciation of the splendid services that he has rendered, and that we will all wish his prosperity and helpfulness and all that goes to make up a good life, in building co-operation in the future as he has so manfully done in the past. I also would like included in the resolution the congratulations of the convention to our secretary for the arrangements of this convention, which I believe has been one of the most successful in the history of the Maryland Farm Bureau.

MR. NUTTLE: I wish to second that motion as the incoming vice-president. I feel that you fellows are losing a whole lot and not gaining very much by putting me in Tom Massey's place.

Rising vote.

CHAIRMAN COHILL: We will now hear from Mr. Fairbank on organization plans for 1933.

SECRETARY FAIRBANK: I am down on this program to

talk about organization plans for 1933. I am not going to say very much because there seems to be a unity of opinion here as to what you folks believe should be done in 1933. That is what I believe should be done.

It has always been my idea ever since I came back to Maryland, that one of the big jobs we had was to make it possible for people to join the Farm Bureau. In my report, day before yesterday, I said I believed we had more believers in the Farm Bureau and fewer paid-up members today than at any other time, and that seems to be substantiated by reports from the counties. I believed that the time had come for us to take a courageous step and reduce the dues. Obviously it is going to be just as hard, if not harder on the State organization to do its work as it is in the counties. We have a little bit of reserve, as your Auditing Committee reported. I hope at this time next year we will have still more. But the only justification for reducing the dues is that there must be many more farmers who would like to join the Farm Bureau, but don't feel they can spend $10.00 a year. That is the only justification for it. We are trying to carry out just as much of a program, if not more, than we have ever done before, and if we are wrong in believing that the reduction of dues is going to bring in more members, then we have made a very, very bad mistake. The assumption on the part of everybody is that if we reduced the dues to $5.00 we could go out and sign up hundreds and hundreds of farmers that we don't have at the present time.

Mr. Anderson is perfectly correct. We at least ought to have two members for the one we have now, and we shouldn't stop there. In order to do that, we have appointed a Membership Committee. This committee is to meet and draw up plans for a State-wide membership campaign to be launched in every county in the State, and I hope in every county that does not at the present time have a County Farm Bureau. Realizing that some of the counties might have to start in a small way, the Committee on Constitu-

tional Amendments brought in a recommendation to reduce the county minimum membership to 50. We have paved the way from that standpoint, and I hope we can look forward to a genuine State-wide campaign in every county put on simultaneously, taking advantage of the enthusiasm and interest and publicity and prestige growing out of the convention. Mass psychology comes from a number of units working together at one time. I would like to name this committee, of which I have been asked to serve as chairman, and I would like to have them meet this afternoon.

MEMBERSHIP COMMITTEE

J. Keefer Funk	Mr. Oswald
William Holloway*	Mr. Shoemaker
Carroll Lowe	Mr. Brown
P. S. Anderson	Mr. Day
H. E. Holsinger	Mr. Derrick

I think our president should also be on that committee ex-officio.

DR. SYMONS: There is one item we overlooked at the directors meeting yesterday. It is usual to approve the accounts submitted for the expenditures of the appropriation that is made for the report and other miscellaneous expenses. I have the detailed report here, which we can keep or hand to the directors subsequently, or pass them out here, for I think for the record it would be proper if the meeting should see fit to order the printing and approval of the report as submitted. That includes the expenditures for miscellaneous items in connection with the State appropriation in accordance with the budget, with the saving that Governor Ritchie requested last year. If you desire, I shall be glad to read these, or give you any totals.

MR. COCKEY: I move Dr. Symons be asked to distribute those, and that we approve of it.

Seconded and carried unanimously.

*Mr. Stagg serving temporarily due to Mr. Holloway's absence.

MARYLAND AGRICULTURAL SOCIETY-MARYAND FARM BUREAU FEDERATION

FINANCIAL STATEMENT FOR FISCAL YEAR 1931-1932

Appropriation for 1931-1932 ..... $5,000.00

Expenditures:

DATE	PAYEE	CLASSIFICATION	EXPENDED
1931—			
Oct. 20.	J. P. Brown	Com. Exh. (Wicomico Co.)	$ 26.25
20.	M. G. Swanson	Com. Exh. (Wicomico Co.)	22.25
20.	Md. Farm Bu. Fed.	Office rent (October)	52.92
Nov. 4.	Hyatt Mfg. Co.	Supplies (ribbons, annual meet.)	6.28
4.	W. Holloway	Travel (Washington Potato Com.)	16.74
4.	M. S. Downey	Com. Exh. (Allegany Co.)	15.00
4.	P. D. Brown	Com. Exh. (Charles Co.)	50.00
10.	L. I. Case	Travel (Balto. Show)	40.92
10.	Bertha Moreland	Com. Exh. (Prince George Co.)	15.00
10.	Md. Farm Bu. Fed.	Office rent (November)	52.92
16.	P. C. McKenzie	Travel (Balto. Show)	29.40
16.	R. S. Brown	Com. Exh. (Talbot Co.)	50.00
16.	John H. Carter	Com. Exh. (Garrett Co.)	50.00
16.	W. H. Evans	Com. Exh. (Caroline Co.)	40.00
30.	Railway Exp. Agency	Express on reports	2.15
30.	O. L. King	Com. Exh. (Calvert Co.)	50.00
30.	R. F. McHenry	Com. Exh. (Allegany Co.)	50.00
Dec. 12.	O. W. Anderson	Com. Exh. (Montgomery Co.)	12.19
12.	H. M. Carroll	Com. Exh. (Harford Co.)	30.00
12.	Mrs. W. R. Dulin	Com. Exh. (Caroline Co.)	10.00
12.	Ernest W. Grubb	Com. Exh. (Queen Anne Co.)	50.00
12.	Md. Farm Bu. Fed.	Office rent (December)	52.92
31.	J. W. Jones	Travel (Chicago meet.)	100.00
31.	H. H. Nuttle	Travel (Chicago meet.)	100.00
1932—			
Jan. 15.	P. B. Pancoast	Com. Exh. (Cecil Co.)	50.00
15.	Harold A. Remsberg	Com. Exh. (Washington Co.)	50.00
15.	Robert F. Coates	Com. Exh. (colored)	10.00
15.	Robert P. Jennings	Com. Exh. (colored)	10.00
15.	Justine N. Clark	Com. Exh. (colored)	25.00
15.	L. H. Martin	Com. Exh. (colored)	25.00
19.	Md. Crop Imp. Assn.	Com. Exh. (an. corn and potato show)	305.30
19.	Md. Farm Bu. Fed.	Office rent (January)	52.92
19.	H. R. Shoemaker	Com. Exh. (Frederick Co.)	50.00
19.	K. G. Connolly	Travel (Balto. an. meet.)	12.75
19.	George L. Schuster	Travel (Balto. an. meet.)	16.68
19.	John W. Heuberger	Travel (Balto. an. meet.)	4.90
19.	Thyra E. Sanders	Travel (Balto. an. meet.)	16.45
19.	Marion L. Olivet	Travel (Balto. an. meet.)	10.84
19.	R. A. Jehle	Travel (Balto. an. meet.)	12.95
27.	J. D. McVean	Com. Exh. (Kent Co.)	50.00
27.	Md. Farm Bu. Fed.	Postage	27.55
27.	B. L. Goodyear	Travel (Balto. an. meet)	3.24
27.	Lord Balto. Hotel Co.	Travel (Balto. an. meet.)	80.00
27.	The Warner Agency	Printng (an. meet. programs)	123.92

DATE	PAYEE	CLASSIFICATION	EXPENDED
1932—			
Feb. 5.	Md. Farm Bu. Fed.	Office rent (February)	52.92
5.	Torsch & Franz Badge Co.	Supplies (an. meet., badges, etc.)	16.40
5.	Hyatt Mfg. Co.	Supplies (an. meet., buttons, etc.)	20.10
5.	Lewis M. Lambert	Supplies (an. meet., signs)	19.40
5.	Amer. Farm Bu. Fed.	Supplies (an. meet., song books)	19.00
13.	United Report Service	Printing (an. meet. reporting)	253.00
Mar. 2.	John H. Carter	Com. Exh. (Garrett Co.)	23.00
7.	Henry C. Whiteford	Travel (Balto. meetings)	12.32
7.	Md. Farm Bu. Fed.	Office rent (March)	52.92
11.	20th Century Ptg. Co.	Printing (Grange reports)	170.60
11.	Md. State Hort. Soc.	Travel (three speakers, an. meet.)	143.64
Apr. 5.	Md. Farm Bu. Fed.	Office rent (April)	52.92
18.	Rwy. Express Agency	Office expense (proof an. report)	.75
18.	Advertisers Eng. Co.	Printing (cuts, an. report)	6.70
18.	S. L. Crosthwait	Com. Exh. (Baltimore)	31.01
May 13.	Rwy. Express Agency	Office expense (proof an. report)	.37
13.	Md. Farm Bu. Fed.	Office rent (May)	52.92
June 14.	Rwy. Express Agency	Office expense (proof an. report)	.38
14.	Md. Farm Bu. Fed.	Office rent (June)	52.92
28.	Day Printing Co.	Printing (an. report)	892.57
28.	M. T. Johnson	Postage	45.00
28.	M. H. Fairbank	Other expenses (labor, reports, meetings, etc.	50.00
28.	T. B. Symons	Other expenses (labor, annual report, com. meet., program, etc)	65.00
28.	A. H. Snyder	Other exp. (labor, an. rpt. prog)	25.00
28.	K. G. Connolly	Other exp. (labor, an. rpt., accts.)	55.00
28.	Thyra Sanders	Other exp. (labor, an. rpt., etc.)	15.00
July 20.	Dorothy Emerson	Com. Exh. (Club Girls)	100.00
20.	Md. Farm Bu. Fed.	Office rent (July)	52.92
Aug. 11.	M. T. Johnson	Postage	77.45
11.	Md. Farm Bu. Fed.	Office rent (August)	52.92
Sept. 10.	Miles H. Fairbank	Travel (Washington, Va.)	63.95
21.	H. M. Biden Co.	Office supplies (Cabinets)	70.20
21.	DeVoe Meade	Travel (Timonium)	4.90
21.	A. B. Hamilton	Travel (Hagerstown)	5.80
21.	S. H. DeVault	Travel (Timonium)	15.24
21.	S. B. Shaw	Travel (Timonium)	27.75
21.	Md. Farm Bu. Fed.	Office rent (separate and special space for meeting)	57.88
27.	Com. Clear. House	Office supplies (tax book)	7.50
27.	Miles H. Fairbank	Travel (New York)	33.90
27.	C. E. Wise, Jr.	Travel (Timonium)	8.18
Oct. 4.	Comml. Off. Fur. Co.	Office Supplies (desk)	17.50
4.	James S. Crooke	Office exp. (refinish office furn.)	18.00
4.	Univ. Md. Studt's. Sup.	Office supplies (stationery)	1.97
4.	Monumental Ptg. Co.	Printing (Livestock programs)	103.21
4.	W. H. Rice	Travel (Oakland Fair)	9.70
4.	S. B. Shaw	Travel (Oakland Fair)	29.75

Total expenditures	$4,750.00
*Reserve	250.00
Total appropriation	$5,000.00

*Returned to State Treasury, at request of Governor.
This account is audited by the State Auditor.

MR. BROOKS: Is this the proper time to return to the subject which was under discussion in connection with the election of officers? I believe our constitution should be so amended that nominations might be made from the floor without the embarrassment to nominees we might have at such a time. I move we have our constitution amended so nominations may be made from the floor by voting delegates.

Seconded and carried unanimously.

DR. SYMONS: Mr. Jones was the author of that constitution, and I was closely associated with him. We are satisfied in our minds that that is the only democratic way to set up an organization. If it is not printed in that copy, it is not a proper copy, because in the formation of the Federation we provided for nominations from the floor.

MR. JONES: I would like to see that copy. I am very much disappointed in it, because I distinctly remember that provision was in the original draft of the constitution. I also believe there are some by-laws that are supposed to go with that.

CHAIRMAN COHILL: This will straighten it out.

SECRETARY FAIRBANK: Do I understand it will read like this: "Section 2, Article 8, Election of President and Vice-President. The President and Vice-President shall be nominated by the Board of Directors and elected at the annual meeting by the authorized delegates and directors representing the affiliated organizations. Further nominations may be made from the floor before election by authorized delegates to the convention." Then it goes on to say, "They shall be ex-officio members of the Board of Directors."

MR. COCKEY: I don't believe that is quite broad enough. I would rather see it made so any member of the Farm Bureau could make a nomination.

SECRETARY FAIRBANK: You are restricting it now to the delegates in addition to the delegates representing the County Farm Bureaus.

DR. SYMONS: I think it should be "members."

MR. COCKEY: The members are as interested as the directors and delegates.

CHAIRMAN COHILL: That was the idea of the old constitution.

SECRETARY FAIRBANK: "Nominations may also be made before election from the floor by any member of the Farm Bureau." That is better. Then the actual voting is done by the authorized delegates.

MR. BROOKS: The only thing is, if a nomination is made by a delegate you are sure his membership is paid and he is in good standing, and you have no assurance of that if nominations are made by the members.

SECRETARY FAIRBANK: That is quite true.

MR. MANN: I don't think we will be bothered with nominations from members who are not in good standing. If they are interested enough to attend the meetings, they are probably paid up.

CHAIRMAN COHILL: Make it "any paid up member."

MR. JONES: I really feel that is too broad. Our directors and delegates are instructed before they come to the meetings. I think the privilege of making nominations from the floor should be extended to any delegate. That is as far as we ought to go.

MR. PIERCE: Is it proper to change the constitution like this? Don't we have to submit changes a month in advance?

SECRETARY FAIRBANK: No. It states, "This Constitution may be amended at the annual or special convention by a two-thirds vote, provided a quorum is present at the meeting. All amendments to the Constitution shall take effect immediately after their adoption." This is not a corporation; that is part of the corporation law.

The issue is whether you want nominations made by delegates from the floor only, or by any member, paid-up member. The amendment now reads, "Nominations may be made from the floor before election by any authorized voting delegate to the convention."

MR. BROOKS: Hasn't that already been passed?

CHAIRMAN COHILL: Yes, but it can be amended.

MR. BLACKBURN: I propose an amendment to that, that any Farm Bureau member may make nominations.

MR. HARRY: I will second that. I am sure it was intended that the Board of Directors should be the Nominating Committee and report their nominations, and then nominations were to be open to any member of the organization, the voting to be done by the directors and delegates.

CHAIRMAN COHILL: That is my undestanding.

MR. FUNK: If any member is to make nominations at this convention, I don't see why we should have delegates. If a member has the right to make a nomination, by the same right he has the power to vote. Then that breaks down immediately the democratic organizations we are supposed to bring up from the counties through the delegates to the convention. Why are we trying to jumble and garble the constitution when a simple amendment answers the requirements of an organization of this kind? I am only a sitting member here from Washington County. I don't want to belong to an organization that is going to have pandemonium running in the election of officers every year. Let us send up from the counties delegates in whom we have trust and faith, and if we don't have faith in them, don't let's send them. If they can't represent us here one year, next year we won't send them back. We have absolute faith in the two delegates voting here from Washington County. I am not going to say a word about the way our delegates vote here. I think we are wasting valuable time.

I am opposed to doing anything further to that constitution than giving the right to nominate from the floor to the delegates.

MR. HARRY: I would like to say in support of my second that the delegates have the right to vote; they have all the power vested in them, but certainly the members have the right to make suggestions.

The question was called for, the motion was put and lost.

SECRETARY FAIRBANK: I don't know if authority is needed to do this, but I suggest the constitution as amended be printed and sent to the members, or sent to the counties, and the members could apply for copies there.

CHAIRMAN COHILL: That is a good suggestion.

Ladies and gentlemen, I want to thank you for the nice way you have helped me along in this session. The meeting now stands adjourned.

The meeting adjourned at one o'clock.

Adjournment.

PROCEEDINGS
of the
Maryland State Horticultural Society
TUESDAY MORNING
January 3, 1933
COLLEGE PARK, MARYLAND

PRESIDENT G. S. L. CARPENTER: The meeting will come to order. We will have the report of our Treasurer and Assistant Secretary, A. F. Vierheller.

REPORT OF THE SECRETARY-TREASURER

A. F. VIERHELLER,

College Park, Md.

Beside the routine of secretarial duties, the year 1932 has brought some new developments which have required attention. The Eastern Apple Growers' Council, composed of the presidents of the State Horticultural Societies east of the Missouri River, met in Washington, D. C., on May 11, 1932, and among other things, appointed a committee, composed of Marylanders, to work on the question of Argentine exports and imports, embargoes, etc., especially the restriction regarding paper wraps on barrelled apples. The members of this committee were J. A. Cohill, T. B. Symons. and G. S. L. Carpenter, and your Secretary also worked with the committee. Through the many activities of this committee and other agencies in the country, American apples were permitted to be shipped, unwrapped, to Argentina.

The Eastern Apple Growers' Council has a chance to be of great value to Eastern growers in solving their common problems, and adds a new value to Horticultural Society activities.

A new plan was tried in conducting the annual Summer Meeting. Three regional meetings were held during the week of July 18, at Smithsburg, Washington County, Havre de Grace, Harford County, and Easton, Talbot County. A short and interesting orchard tour, a picnic lunch, and a program of interesting talks on the apple market situation composed the program of each meeting. The Society is indebted to the growers whose hospitality and assistance made these meetings so interesting.

I am pleased to report a total of 202 paid memberships, which is gratifying.

As Treasurer, I report a balance of $495.04 to December 30, 1932, and ask that the books be audited.

PRESIDENT'S ADDRESS

G. S. L. CARPENTER,

Hancock, Maryland.

Fellow Fruitgrowers and Friends: Everywhere growers ask: "How can we balance our budget?"

We feel that our production expense has been reduced to a minimum. Labor rates and material costs are rapidly reaching a base price beyond which they cannot further be lowered. Certain of our cultural operations have been eliminated in part or entirely, so that the cultural operations most necessary might be performed. This elimination of operations was planned, so that the decrease in the volume of marketable fruit from each tree would be kept at a minimum. However, these measures can only be effective for a limited period, beyond which, the decrease in production becomes marked. Therefore, it behooves us to scrutinize each item of expense most carefully, correcting them by changed methods or by the adjustments found necessary.

With the readjustment of our operating expense accomplished, as far as it lies within our ability to adjust, the

revenue received from the sale of our product becomes of major importance.

Decreased Production.

Our commercial production regulates to a degree the average return of the fruit which we sell, as is reflected by the following figures, compiled by the Bureau of Agricultural Economics, showing the commercial production and average return to the growers:

Year	No. of Bushels	Average Return to Growers
1926	117,384,000	.74
1927	78,051,000	1.39
1928	106,383,000	.99
1929	86,529,000	1.31
1930	101,004,000	.93
1931	104,196,000	.58
*1932	85,155,000	.50

*Estimated.

Production of fruit is largely regulated by weather conditions beyond our control. We can, however, eliminate much of the production of fruit of undesirable and unprofitable varieties by the removal of these trees from our orchards. Production can also be temporarily decreased by the removal of all closely planted acreages.

There is a decided incentive for growers everywhere to effect a decrease in production, if in so doing, they increase the quality of their fruit and eliminate expenditures on the trees contributing to their losses.

Transportation Costs.

Transportation costs are a direct reduction from the revenue received from the sale of fruit, and would be reflected back to the growers in increased returns, substantially to the full extent of the reductions effected. Our present rates have been adjusted but little, and with the low returns which we are receiving for our commodity, the present high

rates are causing us to seek transportation by truck and by water.

Throughout the World, there has been created a price level beyond which the buying public will not go in their purchases of fruit. High transportation costs do mean seriously reduced revenue to the grower. They do not necessarily mean higher net income for the transportation companies. There is a point beyond which shipments become unprofitable and fruit is allowed to remain in the orchards unharvested. This condition, of course, results not only in disaster to our growers but works also to the serious detriment of the transportation companies.

We are not unmindful of the fact that the railroads are facing serious problems, but the basing of rates on present high property valuations and on present high labor rates can only create a rate structure not consistent with low values of the commodities transported.

Export Situation.

Our production of apples was created to supply the markets of the World. In normal years, approximately 20 per cent of our total commercial production is exported.

Exports of barreled apples, for the years 1928 to 1931 inclusive, to our principal outlets are:

Destination	Barrels 1931-32	Barrels 1930-31	Barrels 1929-30	Barrels 1928-29
United Kingdom	1,893,000	954,000	953,000	1,720,000
France	367,000	131,000	8,000	62,000
Belgium	189,000	313,000	14,000	321,000
Sweden	84,000	35,000	95,000	115,000
Germany	73,000	404,000	50,000	236,000
Denmark	73,000	65,000	42,000	81,000
Netherlands	49,000	334,000	17,000	201,000
Canada	31,000	40,000	40,000	63,000
Norway	19,000	12,000	23,000	25,000
Other	40,000	191,000	185,000	181,000
Total	2,818,000	2,479,000	1,427,000	3,005,000

This table shows the United Kingdom as our principal foreign market for barreled apples; in 1931-32, taking approximately 68 per cent of our total barreled exports.

In June, 1930, the United Kingdom prohibited the importation of all fruit not meeting the requirements of the U. S. Fancy and No. 1 grades from July to November 15th of each year. This regulation is still in force.

Up to March 1, 1932, our apples entered the United Kingdom duty free. On that date, however, an import duty of 10 per cent ad valorem was placed on our apples. Apples from Canada and other British dominions are duty free.

As a result of the Ottawa Conference, the British Parliament, on November 15th, approved the Ottawa Agreements Act, making effective a duty of 4 shillings 6 pence per cwt. (112 pounds) throughout the year. Apples from British dominions, Canada, Australia, New Zealand and South Africa, enter duty free.

Imports into the United Kingdom were little affected as regards volume or source of supply by the import duty of 10 per cent, as indicated by the figures shown below which were published by the Empire Marketing Board in *Weekly Fruit Intelligence Notes*:

Receipts of apples into the United Kingdom—July to November inclusive.

Source	Bushels 1932	Bushels 1931	Bushels 1930
United States	2,722,241	3,608,541	2,114,935
Canada	1,663,084	3,175,042	2,387,091
Australia and New Zealand	1,493,356	608,919	1,366,608
Continent	1,261,399	1,300,771	208,171
Other Sources	17,054	25,474	843
Total	7,157,134	8,718,747	6,077,648

It is too early as yet to determine accurately the effect of the duties set up in the Ottawa Agreements Act, effective

November 17, 1932. From figures at present available, the movement of barrel apples for December will not be more than 20 per cent of that in 1931. An accurate picture will not be obtainable, however, until storages in the United Kingdom have their holdings reduced and normal storage conditions prevail.

The restrictions that have been set up may be of some benefit, in that they preclude the possibility of shipping anything but the high quality fruit and should thereby maintain and improve the existing high reputation, which American apples enjoy in the British market.

Similar restrictions are in effect in all countries to which we export, in the form of tariffs, embargoes, sanitary regulations, quotas, licenses, restriction of exchange and depreciated exchange.

There seems to be a tendency exhibited in the past few weeks toward an elimination of further retaliatory tariffs.

It is hoped that the World Economic Conference will materialize and that our incoming President, Franklin D. Roosevelt, will lead the way in correcting a condition, which has our international trade so seriously throttled at the present time.

PRESIDENT CARPENTER: I introduce Dr. F. P. Cullinan, Senior Pomologist, U. S. Department of Agriculture, who will discuss the topic, "Meeting the Needs of the Tree Economically."

MEETING THE NEEDS OF THE TREE ECONOMICALLY

F. P. CULLINAN.

Washington, D. C.

Mr. President and Members of the Maryland State Horticultural Society: I feel it somewhat presumptuous on my part to try to tell you fruit growers how you can cut down on your expenses during the coming year, and just where you can make certain changes that will fit into this economic program. In discussing this subject, I think we shall have to go back to fundamentals.

We recognize that at this time we cannot close up our factory, our orchard. The manufacturer, if he finds his factory is not paying, can close the door; but if we are going to have this factory produce fruit for us four or five years hence, we must keep it going. So there are certain things we must do, and I am going to talk about some of these needs, and how far we can go in making adjustments at this time.

I think there is a general agreement among those studying factors affecting costs, that high yield per tree or high production per acre, is one of the ways in which we can reduce our cost per unit, per bushel, per tree, or per acre. In any fundamental consideration of this question we ought to consider some of those conditions which may help to give us higher yields per tree or per acre, and yet not necessarily greater total yield spread over a large number of acres.

Beginning with this whole discussion we have to go back to our environment, because that is what we are limited by—the particular environment in which we are working. In some sections there are doubtless fruit growers who realize they are working with an impossible environment. That is, if they are on a site where frosts will take their crop three years out of five, or the soil conditions on which they are working are too shallow and the trees are affected by drought, and their production is going to be cut down over a period of years, it is almost impossible to get maximum

production per acre and keep their costs down on the unit with which they are working. Under those conditions, it seems to me, the solution may be to abandon that environment.

In most orchard sections there are certain orchards which are on locations where the soil is ideally suited as to depth, fertility, and moisture conditions, to give uniform crops over a period of years, other things being equal and favorable. There are other orchards located in environments which probably never will give profitable yields over a long period of time. They are what the economist calls marginal or sub-marginal orchards. That is, soil, frosts, and moisture conditions may so affect growth and yield of the tree, that even after growers have done their best to obtain a maximum production with that environment, they are still working under a decided disadvantage. Many growers who have orchards under such conditions are recognizing the importance at this time of abandoning all or part of such plantings.

Moisture is a very important factor affecting the growth of the tree. I take moisture first because it has probably emphasized itself in this section this year more than any other single factor. If an orchard is planted on a very shallow soil in which the root population or distribution in the soil can not go much below two feet, because of a hardpan, or a very hard substrata through which the roots cannot penetrate, obviously the roots will be limited to that very shallow soil area. We have seen some examples of orchards or parts of orchards located on that type of soil. The question comes up as to whether we should abandon part of the orchard site, if we can never make it profitable, or whether something can be done to improve conditions. It may be possible to improve the environment, either by irrigation, or by adding organic matter to the soil in order to increase its water-holding capacity, or by adding mulch which will help to hold rainfall during early spring when we get maximum rainfall, so as to store up a reserve water supply.

Assuming, therefore, as growers, we have an orchard that has possibilities wherein we can improve this environment, how are we going about it? Let us take first, methods of moisture conservation. One very efficient way, in our section, is by the use of mulch material. Where trees are growing on a hillside and a portion of the soil is exposed to the sun, the ground may bake hard during the summer, causing a tremendous amount of rain-water to run off even though the soil is quite coarse. Where the soil surface of uncultivated areas of some soils is left bare, they have a tendency to puddle and bake. The rains during July and August may not be sufficient to increase the water content of the soil because most of the rain goes down the hill in runoff. One way to help hold the rainfall in this soil is by the application of mulch around the tree.

Some years ago we were interested in studying this mulch factor over a period of years, where we had opportunity to study trees which had been mulched annually for sixteen years. The following table gives the yields obtained on trees receiving cultivation alone, cultivation plus straw mulch and nitrogen, straw mulch, and sod with and without nitrogen. These experiments were with Grimes trees growing in Indiana[1] for the period 1921-1925, or during the thirteenth to seventeenth years for the trees.

Yield Record of Trees For the Period 1921-1925
Variety—Grimes

Treatment	No. of trees	Average yield per tree in pounds					Total
		1921	1922	1923	1924	1925	
Cultivation	11	443	122	713	577	184	2,039
Cultivation, and straw mulch plus nitrate	26	459	.....	761	608	229	2,046
Straw mulch—no nitrate	19	376	101	576	630	443	2,126
Sod alone	5	39	22	27	95	150	355

[1]Purdue Agr. Exp. Sta. Bul. 315, 1927.

In these experiments it was found that trees which had been grown continuously in grass for 16 years and mulched with straw, were nearly as productive as trees in cultivation. Had nitrogen been applied to these trees during that period, they doubtless would have been as productive. As compared with trees in grass alone, the mulch was quite an effective treatment. The grass was smothered out by the mulch, while under unmulched trees the grass competed with the trees for the supply of moisture and nitrates. In addition, the mulch decayed over a period of years, producing a fine tilth to the soil under the mulch. Moisture conditions under the mulch were good throughout the seasons. In two dry seasons the moisture content of mulched soils was noticeably higher than unmulched soils. The soil temperature did not fluctuate so rapidly during the season under mulch as under cultivation or grass alone.

From that data we get some indication that mulch may be a means of conserving soil moisture. Straw was used in these experiments because we could apply it in bales and knew how much we were applying per tree. I believe any kind of material you could get that would be relatively cheap would do—swale grass, or material growing in the lower part of the orchard where moisture conditions are favorable for a heavy growth of grass, could be cut and applied under the trees. Better still, if you could get hold of alfalfa, sweet clover, or soy bean hay, which might be grown without too much expense, on relatively cheap land adjacent to the orchard, that material could be cut and used as mulch; and because of its nitrogen content, it would be better than straw alone.

There is another factor in the soil environment which we have to think about if we are going to consider the needs of the trees, and that is the nutrient factor. Moisture and nutrients go together and are linked together somewhat, with organic matter. Where growers are using a system of soil management consisting of cultivation with cover crops and like it very well, it is a very satisfactory system. We

get organic matter through cover crops and thus increase the moisture-holding capacity of the soil by turning under these soil covers. Under mulch a large percentage of the roots may grow close to the surface. They may feed on the decaying mulch. Under such conditions we may have very shallow roots, and under very severe drought conditions we may find that trees with a shallow root system may show some effects of the drought; whereas, trees under cultivation, with roots in deeper soil, may not show that effect. Of course, we are always limited by our environment. If we have a shallow soil, by mulching we are doing something which will help the trees to get by during periods of drought or moisture shortage. But certainly, mulch will help to hold the spring rains and to prevent runoff under conditions where the trees are on steep slopes.

On orchards in cultivation, that show by terminal growth and color of foliage that they require nitrogen, it may not be economical to give up the use of nitrogen entirely. Nitrogen has been shown to be so important and essential in fruit setting, in the growth of fruit, and in the production of fruit buds, that, to obtain this high production per tree I am not sure that it would be sound economics to entirely abandon the use of nitrogen. On the other hand, if you have trees that this year show by their growth that they have made good terminal extension and have a good set of buds, then, with a limited amount of capital, which is needed for pruning, thinning or other orchards operations, you might safely leave nitrogen off that type of trees. However, if the trees are growing in sod, and under the particular conditions which you have, show by color and terminal growth that they need nitrogen, I don't see how you can very well leave nitrogen off those trees. If we cannot add nitrogen to the soil of those trees in grass, when the grass is taking up moisture and nitrates, the next best thing is to do some cultivating, breaking up the sod in those orchards where the grass is competing with the tree. If the land is not too steep to cultivate, crack up the sod, turn it under early in the spring before it starts to grow and compete

with the tree for moisture and nitrogen. In that way we are helping out the tree the best we can, especially during the time of fruit setting and fruit bud formation.

So, in considering soil environment, we take into consideration moisture and the ways in which we can conserve the moisture supply; we take into consideration nutrients; and organic matter, which more and more we are realizing is important in building up a fine type of soil on which to grow our trees. We can get this environment, either by adding mulch, or by growing sod, alfalfa, or sweet clover in the orchard (whatever we find best as a cover for our own particular section), and by discing that under over a period of years, incorporating some of that organic matter in the soil. The organic matter, in turn, will help the moisture-holding capacity of the soil by making it just a little bit more spongy.

So far, I have been talking about one part of the environment, the soil. It is quite as important and just as necessary to pay the same amount of attention to the top of the tree, because that is where our fruit is produced. If we are going to continue to grow trees and keep them profitable, the one thing we have to do is to spray. It seems to me, in order to keep up your orchard, you are going to spray; at least put on the minimum program to control insects and diseases which are of importance in your particular part of the State. I simply want to mention here the importance of an adequate, healthy leaf surface in effecting the size of the fruit, fruit bud formation, and growth of the tree.

We can also affect the growth and the efficiency of the leaves by pruning. Just how much money we should spend on pruning during the next year or two, will depend somewhat on the condition of our orchard. In certain sections where pruning has been followed pretty carefully during the past three or four years, under the dry weather conditions we have had, where the trees have not been overstimulated and have not made a large number of water

sprouts and excess branches in the top, the amount of pruning can be cut down to a minimum, and the cost of production will be decreased thereby.

On the other hand, if our orchards have been neglected over a period of years and the time has come when we have to do a certain amount of thinning out in order to get effective leaf surface, it seems to me we might well spend the money to do a reasonable amount of thinning on trees of that kind. I once heard a man make the statement that it was more economical to grow apples on the outside of the tree than inside, so he left the inside thick and grew them outside. However, there is the possibility of obtaining a greater functional leaf area, exposing the leaves to better sunlight and getting better color by doing a reasonable amount of thinning out on the inside of the tree. But if a grower is up against it, trying to decide on those orchard practices which he is going to use during the next year, certainly he is not going to lose his orchard if he fails to prune this year or the year following. His orchard may slide back more if he is unable to take care of moisture conditions, and particularly nitrogen conditions which are so necessary for proper growth and functioning of the tree.

Along with pruning we may well consider the question of thinning the fruit on the trees. Under conditions of light pruning for a number of years along with adequate applications of nitrogen, we frequently find varieties setting too many fruits. The question is often asked, will it pay to thin the fruits? The answer will depend somewhat on the variety under consideration and the market preference for that variety. Where size and color are not important factors in market demand, it may not pay to thin from that standpoint. However, with many of our commercial varieties, size, color and quality of fruits are very important factors in marketing, and it has been shown that thinning is an important operation in securing them. An adequate leaf area is necessary to obtain size and color on apples and this condition does not obtain on over-loaded trees.

Aside from the effect of thinning on the immediate crop, there is the effect of thinning on fruit bud formation for the following crop. For growers who have trees which are biennial due to over-bearing every other year, it will be profitable for them to spend some money on thinning the fruit in order to secure more nearly annual crops on those trees. This might reduce total production but would pay for the money expended by returns in greater size, quality, and color of fruit. This brings up the question of biennial bearing which I note is to be treated as a separate subject on this program.

Again, we must consider our soil environment when answering the question, will it pay to thin. In years of a heavy crop, trees on thin, shallow soils will frequently yield fruit of small size and poor color, when moisture conditions are below average. Thinning of fruits under such conditions will help to get increased size and color. The effect will be more pronounced with some varieties than with others.

Another point which should be mentioned in connection with the top of the tree is the question of pollination. This has been emphasized many times. I think you all realize that, though you may have favorable soil conditions, certain varieties like Stayman Winesap, and Delicious which normally do not set fruit very abundantly with their own pollen, require the presence of a source of pollen of other varieties. Under such conditions we should consider placing bouquets in the orchards, where a source of pollen of other varieties is not available. It has been shown that Jonathan, Grimes, and Rome Beauty will furnish abundant pollen for cross pollination. That is a portion of the work we should still consider and by no means neglect, because if we are going to get increased production per tree we may have to follow that practice.

In discussing this question of meeting the needs of the tree economically, I have covered some of those needs which we have to consider in any program we are going to attempt,

such as abandoning a certain part of the orchard and concentrating more on a smaller acreage. If we are growing trees in an environment where it is almost impossible to secure good annual production because of frost or moisture conditions, now is a good time to cut down those trees and spend your money on trees that are going to bring a profit.

PRESIDENT CARPENTER: I want to name the following committees, and ask that they report tomorrow:

NOMINATING COMMITTEE

J. ANDREW COHILL, Chairman

J. WALTER ENGLAR — C. E. BRYAN

CARLYLE BARNES — FRANK HANSON

RESOLUTIONS COMMITTEE

LLOYD BALDERSTON, Chairman

HENRY WHITEFORD — WILMER HOOPES

AUDITING COMMITTEE

GEORGE MCCLAIN, Chairman

WILLIAM MOORE

Adjournment.

TUESDAY AFTERNOON

January 3, 1933

PRESIDENT CARPENTER: Our first paper is "Profitable Peach Production—Growing—Selling—Financing", by Mr. C. E. Bryan, of Havre de Grace, Maryland.

PROFITABLE PEACH PRODUCTION.

Growing, Selling, Financing.

C. E. BRYAN, Havre de Grace, Maryland

Before discussing the methods we are to use in growing peaches, it may be well to consider certain inherent limitations of the crop we are to produce.

In the first place, it is highly perishable, and must be promptly consumed. This means not only that production must be limited to the capacity of our market to consume, as the fruit ripens. It also connotes the requirement that our product shall be of such high quality, it will certainly find profitable sale, even if the general crop is too large to find purchasers at remunerative prices.

In the case of apples, or the citrus fruits, some return may be had from the utilization of by-products. Moreover, there is opportunity gradually to work off the lower grades. I would not suggest that the apple grower lean upon by-product plants, and the sale of low-grade fruit. There will always be too many culls, with the most efficient orchard practice. I merely point out that there is no use for cull peaches. The fewest possible should be grown, and those kept off the market. Peaches are more or less a luxury product, and as such, must be produced in accordance with luxury requirements.

We should start therefore, with the fixed idea of producing fruit of the highest quality, which will reach the ultimate consumer in prime condition, and in attractive form. Our constant aim must be to stimulate demand for our product, the demand bred of satisfied consumers. The grower, merchant, or method of distribution which puts peaches of poor quality, condition, or flavor on the market, is the real menace to the industry.

Starting with the idea that *profitable peach growing* demands production of fruit of the highest possible grade, let us consider briefly, the various factors involved.

PRUNING

The exact method of pruning to be employed, may be developed by each individual, to correlate his cultural and fertilization practices, soil-fertility, moisture supply, etc., *provided* enough pruning is regularly done to allow sufficient sunlight through the tree, and to permit thorough spraying.

It may be well to note, however, that pruning must be heavy enough to keep the trees in vigorous growth, remembering that peaches are borne on new wood. Pruning should also be done in such a way as to limit the quantity of fruit to that which can be properly matured by the tree, in relation to soil and moisture conditions—in other words, pruning of peach trees should do a large part of the work of fruit thinning. The so-called "long system" of pruning is perhaps economically the best, if proper steps are taken to keep the tree from getting out of hand, on fertile soils, with varieties like Hiley.

FERTILIZING

Peach trees undoubtedly require very high fertilization, being rapid growers, and rank feeders. They require several times as much as apple trees under similar conditions.

While nitrogen is the principal element required, it would be unwise to assume that phosphorus is not needed, with-

out experimental proof to the contrary, in each orchard. In some soils potash also is required. Recent experiments have indicated that lime may be required to bring the soil and subsoil sufficiently near neutral to enable the trees to take up required potash.

A vigorous peach tree produces a large amount of new wood each year, and a considerable weight of seeds. This material undoubtedly requires lime, potash, and phosphorus, which can only be obtained from the soil.

It is well to remember that fine peaches are borne on strong new wood. If the tree is to develop a profitable crop, and at the same time produce an adequate supply of new wood, with strong fruit buds, it is obvious that there must be an abundant supply of required elements in available form.

There should never be any thought of "off years" in peach production, except from severe freezes. Even the effect of a moderate freeze will be mitigated by having trees in high vigor. A year without a crop, is a year lost. Much of the expense goes on, and a definite proportion of the life of the orchard has been wasted.

SPRAYING

No one should even contemplate peach growing, unless prepared to do an intelligent and thorough job of spraying, with adequate materials, machinery, and manpower. The industry is suffering today, because too many men planted peach orchards without realizing this.

In the matter of spray material for peaches, I feel we are far from our goal. Self-boiled lime-sulphur made peach growing a possibility. Mr. Scott showed the way again, with his sulphur-glue paste, and we owe Professor Farley a great debt for his work with Dry Mix; but there is a long way yet to go.

While we have measurably overcome so-called arsenical

injury, by doubling up on lime, we still have considerable physiological injury, of an apparently cumulative type, which I am inclined to attribute to excessive amounts of sulphur. It may prove desirable to use smaller quantities of sulphur in each application, and depend for fungus control on more frequent and thorough spraying. Or it may be that an effective fungicidal material may be developed, which the peach tree will tolerate better than pure sulphur. At all events, this opens a very promising field for scientific investigation and experimentation.

The matter of a suitable "carrying" spray, to protect the fruit from brown rot in transit, from the tree to the consumer, is important, and under some conditions, may be vital. I have worked out such a spray for myself, but realize that the co-operation of scientific men would have been of very great benefit.

Perhaps more rapid progress could be made by a closer co-operation between the Experiment Stations and the more progressive commercial growers. The scientific work done by the State Colleges and by the manufacturers, has been of inestimable value. But the ideal laboratory for proving the results of such labors, and as a source of suggestions for fresh exploration, will always be the commercial orchard. In no spirit of criticism, but merely as a suggestion, it would seem better for the Experiment Station to expend most of its resources in co-operation with, and devising practices for, the progressive, commercial grower, rather than the average orchard. This would not only promise more rapid progress, but would be more effective in increasing the productivity of the commonwealth as a whole, which is the soundest justification for Government appropriations for agriculture.

There are many who feel that they can do a better job with a duster than a sprayer. If such men are acting on the basis of adequate comparative data and are making a relative financial success of their enterprise, a duster is the proper thing for them. My own experience has led me to

give up any thought of dusting as a substitute for spraying.

Whether we dust or spray, and whatever materials we may use from time to time, it is the plainest of facts that we must approximate a perfect job, if we are to get satisfactory results. And this means that we must at all times during the development of the peach, right up to the time it is consumed, maintain an adequate protecting film, covering the entire fruit.

ORIENTAL PEACH MOTH

The Oriental Peach Moth is perhaps the most important unsolved problem in peach growing. Apparently, there is little hope of developing any control through spraying, and it looks as if we should have to depend upon natural parasites. I earnestly recommend this problem to our entomologists, as worthy of their best efforts.

CULTIVATION

In those sections where irrigation is not practicable, cultivation is one of the first essentials in successful peach production. In our normal season, a proper soil mulch must be maintained at all times, for moisture conservation. If the orchard has just been cultivated before a shower, it is necessary to go over it again, as soon as the soil is tillable. During the past three seasons of unparalleled drought, I was able to grow crops of good-sized fruit, largely by reason of continual cultivation.

It is obvious that cultivation should start as early as practicable in the spring. It is equally clear that we need substantial cover-crop growth, to maintain soil fertility and water-holding capacity. As in many other cases, it will be necessary to compromise between two conflicting claims. It may prove better to delay until sometime in May, turning under the cover crop. The moisture requirements of the trees are less up to that time, and we can reasonably hope for abundant showers to make good the loss due to cover-crop evaporation.

Cultivation should continue until picking begins, or until the tractor cannot go through the orchard. The practice of seeding down the peach orchard to a cover crop in July, seems to me a very bad one. It is during the last two or three weeks that the peach makes its greatest demand on available soil moisture, and everything possible should be done to maintain a sufficient supply.

After the crop is harvested, and the orchard cleaned up, the soil should be thoroughly worked up, before seeding.

COVER CROP

The cover crop to use is that which will produce the largest amount of vegetable matter, between the dates of planting and turning under. It is doubtful if a leguminous crop is suitable, unless it meets this test. In my own situation, rye has given best average results, but I should like to find something better.

THINNING

There is no doubt in my mind that intelligent and drastic thinning is one of the four vital factors in profitable peach production. It is essential for several reasons: to produce peaches of profitable size; to prevent the breaking down of trees; to conserve the trees' vigor in producing buds for the following season's crop.

Thinning should be started as soon as practicable, so as to be completed, if possible, before the seeds are fully developed. Usually before the end of May, the fruits which are to drop in June can be plainly distinguished. The amount of thinning to be done will depend on pruning, moisture conditions, etc., but it will not be out of the way to specify an average of eight to nine inches between peaches.

The cost of thinning, while actually a large item of expense, should be regarded as an essential economy. A properly thinned crop will probably yield more bushels of salable fruit, and certainly will bring in more dollars. The

cost of removing a peach at thinning time is obviously only a fraction of the cost at picking time.

BORERS

I think we may regard the borer problem, except for trees of under three seasons' growth, as being satisfactorily solved. Para-di-chlorobenzine properly applied, is entirely effective. I have noted no bad effect, immediate or cumulative.

You may be thinking that I am urging higher production costs, at every step, although our problem is largely one of retrenchment. But I have found that the only possible chance of making good in the peach game, is to produce and market fruit of the highest quality.

This does not mean we should neglect any possible economy. It is a problem of getting the most for each dollar spent, rather than limiting the dollars required for best results. If the grower's resources do not permit him to spend the amount necessary to produce peaches of the highest quality, my advice is to cut down his acreage to the point where he can take care of it properly. There is a better chance of avoiding loss with a small acreage properly cared for, than with a larger planting less carefully tended. This is the time above all others, to cut out unproductive or weak trees. No trees should be retained which do not give reasonable promise of bringing in more than is expended in their care. I have cut out three thousand peach trees in the past two years.

THE SELLING END

It goes without saying, that a product should fit the requirements of its market, in variety, quality, pack, etc. Careful grading and packing may not pay in some markets. But there will always be enough second-grade fruit to meet this low-grade demand; and I repeat, the best chance for profit is in catering to the most exacting trade. The low-

grade product will never pay the cost of production, and should be regarded, at best, as an undesirable by-product.

Except for the very small grower, the middleman is an indispensable factor, not only to provide at all times an outlet of sufficient size, but also for actual economy in distribution. I know it is the fashion to talk against the middleman, and most of them are bad enough; but our social and industrial systems have been built up in such a way, that direct selling on any large scale, is impracticable and uneconomical.

PACKING

Under the head of "selling," packing is one of the most important steps. Fruit well-packed is half sold. Packing begins with picking, and that should be done with more intelligence and care than is usual. Picking peaches on just the right day, is essential to get the fruit to the consumer in good condition, juicy and fine flavored. After picking, all steps should be taken to get the fruit into the iced car, or on its way to the consumer, as quickly as possible.

Grading, both as to quality, and as to size, cannot be too carefully done. The label of a grower who becomes known for absolute integrity and dependability of pack, can easily be worth a dollar a bushel. I have proved it.

In the matter of style of package for peaches, we are nowhere near a satisfactory answer. For many reasons, the six-basket carrier was the best package yet devised. The bushel basket is, in my opinion, entirely unsuitable. I have been a close observer of peaches on the market, and have been struck with the poor condition of fruit in bushels, especially from distant points. There is too much weight of fruit in one container. The flat, or lug, promises well for certain trade. We need a low-priced container, easy to pack, which will carry the fruit to the ultimate consumer, in nearly perfect condition.

The placing of peaches in cold storage should be pro-

hibited. The breakdown after cold storage is so rapid, both the retailer and the housewife feel they have been "gypped" after buying such fruit. Even prolonged storage in iced cars is a potent cause of shrunken demand.

The transportation question has been changed radically, and is changing while we watch. A few years ago, the refrigerator car was the only practicable method of shipping peaches, and is still the best method, except to nearby markets. Shipping in carlots imposed a minimum-size restriction on commercial orchards. Now, however, the truck has come, and I am inclined to think it will eventually entirely supplant the railroad in handling fruit, at least for distances up to two hundred miles. This has brought down the minimum-size requirement of commercial orchards, perhaps 75 per cent. In fact, the limiting factor would now seem to be the economical use of one high-power sprayer—a matter of production rather than transportation.

FINANCING

In the matter of fixed capital, meaning the cost of real estate, plantings, machinery and equipment, none should be borrowed money. The plant of a peach grower should be built with his own money, and expanded gradually, only out of profits. The business is too hazardous, and the profits to be expected too small, to justify investing borrowed capital. Peach trees are short-lived. Orchard equipment is subject to rapid depreciation and obsolescence. It is bad enough to lose your own money, much worse to lose that which you have borrowed. Moreover, if fixed capital is covered by mortgage, it becomes very difficult to properly provide necessary working capital.

In the case of working capital, a large part may properly be borrowed each year, at least that required to cover growing costs after frost danger, and for packing, etc. But it is very desirable to have only one creditor—your bank. If your fixed capital is free of encumbrance, and you have the reputation of being conservative and business-like, you

should have no difficulty in obtaining adequate banking accommodation. All purchases should be made for cash. The amount to be saved in this way is larger than most growers realize. By buying in quantities from the manufacturer, for cash, savings of from 5 to 25 per cent can be made, and may easily mean the difference between profit and loss.

Once more I advise that any orchard proposition, too big to carry on at highest efficiency, by conservative borrowing, should be reduced in size.

Almost any one of the points I have touched upon, is worthy of an afternoon's discussion.

QUESTION: You spoke of some injury from too much sulphur. What kind of injury is that?

MR. BRYAN: It is an injury principally to the stem of the peach. The inner bark of the stem is dried up and the peach does not get sufficient sap. The injury sometimes goes clear through the stem. I am inclined to attribute it to sulphur. I think a modified dry mix with probably half the amount of sulphur is the answer, so far as I know now. As to the dry mix, I might suggest that commercial dry mix should not be used, in my opinion. You should use a sulphur and casein mixture, adding your fresh lime in the tank.

QUESTION: Do you feel that the pruning practices can be changed at the present time in an effort to secure a more economical pruning operation by the elimination of the numerous detailed cuts and changing the pruning program so that more of the long type of pruning is practiced without incurring a thinning cost that would probably more than make up for the economies effected in pruning?

MR. BRYAN: That is one of those questions which is hard to answer. I think the long type of pruning should be adopted, except when the tree gets too high and then you

have to cut out a big branch. For many years I did a great deal of detailed pruning. In the last two or three years I have come to the conclusion that you can do too much small pruning, because you reduce the leaf area of the tree too much in that detailed pruning. In the last two or three years we have left all healthy small wood on. There isn't much difference in the cost of pruning and thinning of fruit. I think you have to shape your pruning practice from other considerations besides cost.

QUESTION: You feel it is more a question of getting more desirable production of fruit, rather than economy that would determine your pruning practice?

MR. BRYAN: I would either want to give up growing peaches, or else grow thoroughly good ones. No matter how much we economize, there are lots of necessary steps entailing large expense, which you have got to go through with, and your low-grade peaches will not pay for those necessary steps.

QUESTION: How deep do you figure you get with the disc?

MR. BRYAN: We use a 16-inch disc to chop up the rye sod, cutting four to five inches deep.

QUESTION: What kind of harrow do you use?

MR. BRYAN: A light draft spring tooth harrow made in sections, each one working independently, each section held down by a very strong spiral spring. It is the most effective orchard harrow made, so far as I know.

QUESTION: You didn't explain how you got your thinning done properly?

MR. BRYAN: You wouldn't thin enough. You couldn't bring yourself to take enough off. Show the man how to do it, and leave him; and after he has thinned, tell him he hasn't thinned enough.

QUESTION: What is your fertilizer?

MR. BRYAN: For peaches, for about 15 years now, I have used a mixture of two parts nitrate of soda to one part of acid phosphate, put on at the rate of about 10 pounds to the average tree. That means about six and two-thirds pounds of nitrate each year. On the larger trees we put about ten pounds of nitrate, scattered around the tree. In the case of trees, covering 20 by 30 feet in area, broadcast over the entire ground.

MR. TOWSON: Does that affect the flavor of the peach?

MR. BRYAN: Not under proper conditions, but in some cases it will make a very much better flavored peach because it means a healthy, normal peach.

QUESTION: In a normal year with trees from 7 to 11 years old, what is your average yield per tree in the case of two or three different varieties?

MR. BRYAN: Average normal yield would be about 5 or 6 bushels to the tree. We have had 10 bushels to the tree.

MR. TOWSON: How far apart are the trees?

MR. BRYAN: In my present orchard 20 to 30 feet. That is too close.

QUESTION: You must have good ground, yet you say you use 10 pounds nitrate of soda?

MR. BRYAN: Maybe it is because I use 10 pounds of nitrate of soda.

QUESTION: What time do you apply fertilizer in the spring?

MR. BRYAN: Just before the blossom buds swell. Any time, after the ground is in good shape. We make only one application. There is a good deal of misapprehension as to leaching out of nitrate of soda. It is astonishing how

long it stays in the ground. I had a block of trees that didn't look so well, and gave them a second application, about the end of June. The following spring, practically a year after, the rye was about 2½ times as tall in that block as in the adjacent one. If I were planting Hileys I should put the rows at least 35 feet apart and the trees about 25 feet apart. With a variety like Hale I think 20 by 30 is about right.

QUESTION: You would vary that with the type of soil?

MR. BRYAN: Yes, but it is surprising how near a uniform growth you can get with nitrate of soda. My soil is clay, running all the way from the white oak type to good red clay overlaid by loam.

QUESTION: You said 20 to 25 years would be the life of an orchard?

MR. BRYAN: I should say the average life of a peach orchard under the best conditions is about 15 years. A peach orchard can be kept in a perennial state of bearing by replacing sickly and dead trees. I will tell you some of the ways my trees go out. The bark seems to die. There are brown spots that come on the bark some distance above the ground, and if you dig into that bark you will find it is dead all the way to the sap wood. Of the trees we have taken out in the last two or three years, I suppose nine out of ten have had an apparent disease of the bark. The roots were all right, but right above the surface of the ground the bark was dead. Some people might call it frost injury. We don't wait for a peach tree to die before we take it out. Whenever the terminal growth has not been satisfactory, that tree gets the axe. I want to get a new tree in its place to produce.

QUESTION: What is your dormant spray?

MR. BRYAN: I formerly used regular dormant spray on peaches, but now I use a dilute lime-sulphur dormant spray

only to control leaf curl. If I found any scale, I should use more.

QUESTION: You spoke about trees making an unsatisfactory terminal growth. What is your standard?

MR. BRYAN: Of course, it varies with the season, but an old bearing tree, a tree that has had big crops for several years, I like to see make a minimum of about a foot terminal growth. I would rather see it make a couple of feet, but when the terminal growth is only a couple of inches, it is unsatisfactory.

QUESTION: After you have applied nitrate and have an efficient leaf surface, I notice a difference in the yield different years?

MR. BRYAN: Moisture is absolutely the limiting factor after fertilizing, pruning and thinning have been done. Moisture is the most important factor in growing peaches that we cannot control except through irrigation. I have no idea of starting irrigation. I haven't water enough. But last year was the third season of excessive drought, and I wanted to see what water would do. The only pump available for that peach orchard was good for 25,000 gallons a day. The orchard is very hilly and not adapted to irrigation, but I laid a few pipes over it, and at the side of each tree row dug a shollow ditch and short cross-ditches between the trees, and let the water run in. The 25,000 gallons a day took care of about 250 trees.

I did that about two weeks before the peaches were ripe, and while it was an experiment, the improvement in the size, color and quality of those peaches was more than enough to pay the entire expense of digging ditches and everything else. So you people down on the Eastern Shore, with comparatively level ground, should very seriously consider irrigation, even if the expense seems unduly high. Normal seasons probably won't justify the expense, but if

we have conditions anything like the last three years it would be amply justified.

PRESIDENT CARPENTER: We will have the pleasure of hearing the topic, "Diagnosing Peach Problems", discussed by Dr. J. H. Beaumont, Head of the Horticultural Department, University of Maryland.

DIAGNOSING PEACH PROBLEMS

J. H. BEAUMONT

College Park, Md.

Mr. President and Members of the Society: We recognize many serious problems confronting the peach grower. Mr. Bryan has so clearly and ably analyzed them for us that you most certainly can draw thoughtful and concise analogies to your individual problems. Further discussion on my part would tend to detract from his directness and perhaps confuse the essential procedures he has so clearly defined.

However, there are several points which I should like to reemphasize. We recognize, and understand in part, the very grave national and international economic conditions which are affecting production, exchange, and consumption of goods. While peaches may not be exported, the sale and consumption of the peach crop is nevertheless directly affected. The grower is confronted with high costs of production, high transportation and marketing costs, low buying power of the consuming public and consequent hazards of technical over-production, low prices and no margin of profit. In this rather gloomy picture, the Maryland peach grower occupies a fairly advantageous position compared to that of the grower in most other regions. He is close to the largest markets in the country, has good railroad facilities, has the truck and good roads which have reduced costs of transportation and broadened the market. The

grower more distantly removed from markets does not enjoy these advantages to the same extent. The difference may mean a margin of profit and control of the market for the Maryland grower. For example the Western box apple man doubtless expected to make a killing this year. But, add together the costs of production, transportation, and marketing and subtract from this the price people are able or willing to pay and the result is zero or even a minus quantity. There can be no better explanation of the absence of the boxed apple on Eastern markets. The same principles apply to peaches. Our grower will not subtract so much for transportation and marketing. For this reason he has certain assurances against competition and can further increase this advantage by catering to and developing that part of the market formerly held by the high quality fruit from other sections.

We have no assurance that present economic conditions will improve rapidly. The days when peaches will again bring 8 to 10 dollars per bushel seem very remote indeed. Our chief problem is to remain in business. Costs of production, overhead, and marketing must be reduced to a minimum but at the same time the consumption and public favor which the peach has enjoyed must be maintained or increased. Quality at less cost. Mr. Bryan has stated how this may be done: spray, prune, fertilize, cultivate, thin, grade, and market the fruit from the best trees growing on the best soil where frosts are least damaging. Remove the poor varieties, the weak trees, the trees on poor soils, and in frost pockets. Get rid of each tree that is not returning a dividend. Part of the saving affected by removing unprofitable trees when applied to the better trees will increase the yield and quality of their fruit.

If we are to concentrate our efforts on making our good trees produce more and better fruit per tree, it might be well to consider the inter-relationships of various of the cultural features that have been mentioned. Let us represent a tree as an equal-sided triangle, the area of which will

be the maximum yield of high quality fruit per tree. The area in the yield of such a triangle will be determined by the length of any one side. We will consider the base as the soil in which the tree is growing and the two sides as, first the management of the tree and, second pest control. Obviously the soil, at the time of planting and throughout the life of the orchard, is an extremely important factor in determining the length of life and performance of the tree. The factors that Mr. Bryan discussed such as freedom from pest, natural fertility, depth, physical properties, and drought resistance, all are properties which add to the length of the base of our triangle and increase its area. The soil can be changed or modified only within relatively narrow limits and at considerable cost. Nevertheless cultural practices such as early and thorough cultivation, fertilization, cover-cropping, green-manuring, and irrigation have such profound effects on the growth of the tree and fruit that they are indispensible. The cultural practices, however, are easier and yield greater returns per dollar expended on good soil than on poor soil. They will increase the yield of quality fruit much greater and at less cost in proportion.

It is unnecessary for me to go into detail as to why soil fertility and moisture are so important. You, as peach growers, know that your best trees are on the best soil and not because you have given them any better attention than the poor trees. You also know that your cover crops grow better and that less fertilizer is required on these areas than on the poor areas. You also know that because of these favorable soil moistures, organic matter and fertility conditions the size, color, quality and quantity of fruit is superior. If the poor trees are unprofitable follow Mr. Bryan's advice, use the axe and concentrate your labor and machinery on the better trees.

Let us assume then, that the base line of soil fertility and soil management is fixed at a given set of maximum sized tree and yield of high quality fruit. The tree must now

receive some attention such as pruning, and thinning to adjust it to the capacity of the soil, and to enable it to produce the maximum quantity of high quality fruit. There is only one reason that Mr. Bryan can grow as large trees as he does. He apparently has a wonderful peach soil and has applied the best soil treatments to maintain and increase its fertility. But, also, his pruning and thinning practices have permitted the trees to utilize this soil to the very best advantage and to bear large crops of high quality fruit. In North Carolina where the soil is very poor, the tree will grow only to a fraction of the size of Mr. Bryan's and the heavy pruning and thinning practices employed there doubtless are essential to maintain vigorous growth and to leave a surplus of soil moisture and fertility to put size and quality into the fruit. The important point is this: too little pruning or thinning or both will create too great a drain on the soil and tree, leaving no margin of safety for adverse weather conditions. The quality of the crop will inevitably be reduced. On the other hand, too heavy pruning and thinning most certainly will reduce the total yield though the quality will be somewhat increased. However, the tree and soil will not be producing to capacity in either case, consequently, a part of the cost of pruning, cultivation, fertilization, as well as the natural capacity of the soil to produce will have been wasted. This is poor economy—every tree should be made to produce its maximum in high quality fruit. It is safer to err on the side of too heavy pruning and thinning, however, than on too little because of the inevitable reduction in quality and the serious secondary effects which are likely to follow over-bearing.

Perhaps our next point will illustrate more clearly the principle of our triangle. The third side of the triangle is represented as pest control. We cannot produce quality fruit without pest control which means spraying and orchard sanitation. Neglect or inefficient control of curculio, brown rot, leaf curl, scab, scale, and borers can only mean that the yield and quality of the fruit and perhaps the life of the tree are seriously affected. The advantages of good

soil, good culture, thrifty trees, careful and intelligent pruning, and thinning are all wasted. By shortening this side of the triangle the two other sides are automatically shortened and the yield suffers. The only possible economies here are careful and thorough spraying which may mean a new capital investment in spray equipment to cover the trees in the correct time or to reduce the number of trees to the capacity of the spray rig you have and to use the most effective materials. Borers and scale must not be permitted to weaken or destroy that tree which has been producing a good crop each year. These operations must be done economically but I am sure that you can see that there are many places where inefficiency or neglect is the poorest kind of economy. It is possible on very good soils to "get by" with less or even no fertilizers for a few years providing, of course, the pruning and thinning are modified somewhat so that size of tree, size and quality of the fruit, may be maintained in balance with the reduced soil capacity.

The value and importance of maintaining the organic matter content of the soil is being repeatedly emphasized and verified by experimental evidence at least in relation to the effect it has in maintaining desirable moisture conditions. Experimental work conducted in this and other States shows that under dry or adverse weather conditions, a tree will be able to develop size and color on only a relatively small number of fruits. This means that, under such conditions, drastic thinning is necessary to permit the tree to develop size on a small crop equal to that of a tree with good moisture and a much heavier crop. Of particular interest is another fact brought out in all these experiments, namely, that peaches which have made poor growth early in the season because of deficient moisture will not attain the size of peaches which have made normal growth even though abundant moisture were supplied later. That is, size of peach in July is directly related to size in September. This emphasizes the importance of early season cultivation and fertilization to insure good growth during

the first period of growth of the peach and also to encourage proper growth of wood for next year's crop.

Our first and best efforts should be toward keeping our trees in good growth, with plenty of large, healthy, green leaves; trees able to carry a good crop of large, well-colored fruit.

The diagnosis of peach tree troubles, then, is a matter of "feeling the tree's pulse." If the tree seems to carry good, healthy leaves, but grows slowly, look at the soil, and use cultivation, cover crops and nitrogen fertilizer, accordingly. If the leaves are poor, weak and dull-colored, look for borer, and possibly yellows. If leaves are damaged, look for insect or disease or spray injury. If, after taking care of all of these problems, the fruit is small, try heavier thinning, but if the fruit is small, even after all of this treatment, it is possible that the tree is too large for the moisture supply of the soil, and this means heavier pruning, to adjust the tree to the supply of moisture and plant food elements which the soil can furnish.

PRESIDENT CARPENTER: The topic, "Fruit Production Costs—How Can We Reduce Them?" will be discussed by Mr. Frank W. Farnsworth, a prominent Ohio fruit grower.

FRUIT PRODUCTION COSTS—HOW CAN WE REDUCE THEM?

FRANK W. FARNSWORTH

Waterville, Ohio.

Fruit growing has many fixed costs over which the grower has only an indirect control; likewise, many operations are nearly as fixed in their importance as are the overhead items of interest, taxes, depreciation, etc. The value of such operations as spraying, pruning, thinning, fertilizing, is, in most instances completely established with every grower who is making a business of fruit production. However,

wide differences often exist in the results obtained from different methods of performing our essential orchard operations. It is mainly the latter phase that I will discuss. By way of introduction a brief description of our organization and methods might be appropriate. Our firm is named for my father, W. W. Farnsworth, who, with my brother-in-law, W. E. Young, and myself constitute the officers and managers. The 200 acres are situated 15 miles southwest of Toledo, on the Maumee River, on very level, sand loam. Twenty miles of tile drain underlie the farm. Approximately two-thirds of the acreage is in apples, about one-third in cherries, with 20 acres in plums and pears. Cherries and plums are cultivated with cover-crops sown where practical to secure a stand, while apples are mulched with straw and other litter and left in sod until indications warrant tearing up the sod to practice clean cultivation. A succession of apple varieties are produced, starting with Transparent, Duchess, Chenango, Wealthy, McIntosh, R. I. Greening, Jonathan, Grimes Golden, Baldwin, Sutton Beauty, Spy, Stayman, Stark, and Rome Beauty. Sour cherries exclusively are grown, while Bartlett constitutes the main pear variety. Damson, Dukes, and Prunes are the main plum varieties with some of the earlier ones as Bradshaw, Gueii, then Black Diamond, and Pond Seedling included to fill out the assortment. The assortment of varieties of all fruits increases the demand on the wholesale market by forming a succession in the market, and at the farm salesroom the different varieties build up a very attractive display. Another decided advantage in the succession of varieties is that of using the harvesting, packing, and marketing set-up continuously, and of giving the market a more continuous supply, as well as affording a more continuous income for the grower.

Orchard soil management is the foundation of the orchard industry. Doubtless more information has been given on this subject than on any other in this business, and more

questions remain unanswered in this problem than in any other. Our experience with orchard soils has shown the best method to be seeding the young orchard to alfalfa and then fertilizing both cover-crop and tree. However, the June grass crowds out the alfalfa soon making it a June grass sod. One apple orchard planted in 1909, seeded in 1914 (virgin soil) showed June grass sod's ill effects by 1926 to the extent that three rows were plowed up that June, showing decidedly marked improvement late that season, and the balance of the block was likewise plowed up and disced up the following April with results as here indicated:

Comparative Yield of Mulched and Cultivated Trees.

	Mulch	Cultivation
GRIMES—Age 21 years:		
1930—Total yield of plot (bu.)	713	417
1931—Total yield of plot (bu.)	158	148
1932—Total yield of plot (bu.)	726	584
Total 3-yr. yield per tree (bu.)	64	23
STAYMAN—Age 18 years:		
1930—Total yield of plot (bu.)	136	362
1931—Total yield of plot (bu.)	219	217
1932—Total yield of plot (bu.)	274	492
Total 3-yr. yield per tree (bu.)	37	31
ROME—Age 17 years:		
1930—Total yield of plot (bu.)	475	379
1931—Total yield of plot (bu.)	519	418
1932—Total yield of plot (bu.)	568	1,224
Total 3-yr. yield per tree (bu.)	49	43
Average total 3-yr. yield per tree—Grimes, Stayman, Rome	50	32

Apparently the sod used all the fertilizer, for some plots of the orchard were fertilized far in excess of the usual amount, to see if they would respond, but they responded very slightly until the sod was turned over and started to rot into the soil, thus building it up and permitting the trees to absorb all the fertilizers.

For removing the soil where it is well established, a side-

cutting tractor disc harrow has been found very satisfactory provided use of this heavy disc stops before it penetrates far enough to cut the feeder roots of the tree. Sod can be removed from very near the tree by trailing the disc attached to a chain behind the tractor. It will automatically lead nearer to the tree when thus hitched, thus saving much hand work, and yet not crowding the tree unduly. Wide cultivation tools as a 14-foot double disc harrow have shown cultivation savings by requiring less trips per tree-space, and by discing nearer to the tree where clean cultivation is desired. In this connection, a saving of man labor was effected in setting a large cherry orchard, by marking out the tree rows with a plow, then cutting the furrow wider and deeper by further tractor plowing. In setting on a hillside of heavy soil during one of our four successive dry summers the soil was found too hard to penetrate with the hand shovel to advantage. A Killefer chisel was run about 10 inches deeper than the furrow bottom which greatly facilitated shovelling and, had normal rain followed this operation the chiselled rows doubtless would have shown improved growth over those not so loosened up. This practice, ahead of setting the trees, will loosen up many soils and make root conditions more congenial.

Cultivation is stopped about June 15, after which time the weeds and grass are permitted to grow to about 12 inches, or less, if drouth prevails, when they are clipped with the mower. A tractor mower, attached to the track-layer tractor and operated by its engine power, has proven through five seasons to be very satisfactory. The seven-foot bar reaches under the branches and, with the quick-turning feature of the track-layer most of the growth in the rows between the trees can be mown by machine.

Four consecutive seasons' moisture deficiency was telling on our trees and crops this last August to the extent of prompting us to experiment with irrigation. Transparent and other early varieties showed the lack of moisture, and later varieties were showing it increasingly. One thousand gallons to 1,500 gallons were applied per tree at a cost of

about 40 cents per 1,000 gallons. This includes furrowing around the tree with tractor and plow, pumping the water with a three-inch centrifugal pump, and hauling it in tanks of 400 gallons capacity for a distance averaging three-quarters of a mile. Doubling the distance to haul the water practically doubled the delivered cost per 1,000 gallons. An inner tube attached to a four-inch opening in the tank-bottom released the 400 gallons onto the tree-root area in about two minutes. Outlet is a big item in hauling large quantities of water. This practice, started August 10th, brightened up the tree's foliage considerably, relieving the wilted appearance, which apparently helped the trees until the September 3rd rain came, the first virtually, since May 14th. This 1,000 gallons per tree is equivalent to about one acre-inch of water which represents a small fraction of the seasonal requirements of the tree which is about 20 inches, but a small amount at the critical period seems to relieve the situation at least temporarily. A few Rome Beauty and Grimes trees near the spray water well were watered with about a thousand gallons per hour for about 36 hours continuously. This produced decidedly richer foliage, a quarter inch larger apples, and half more blush on the fruit, particularly the Grimes. The fruit thus watered, did not, however hang on as well at picking time as did those not watered. Doubtless, this amount was excessive, setting up extremes in growth conditions. Further irrigation is contemplated this coming season, the system being also planned to facilitate distribution of water for spraying.

Pruning, while a hand operation, has shown some object lessons in cutting costs, even though, strange to say, more work is required to accomplish this. It is our practice to prune each tree on the farm each year. Yet, with this regular pruning, before such varieties Grimes and Rome are 12 years old they require detailed thinning of the wood over their entire bearing surface. This practice, extended also to Jonathan, has enabled 36-year-old Jonathan trees to produce high quality fruit through their entire centers

as well as on the outside of the tree. This better distribution of fruit enables the tree to carry heavier loads with safety to the tree, and less wind damage results with the fruit in the sheltered area.

Removal of brush has prompted many growers to devise labor-saving methods for its disposal. A tractor brush rake, pushed ahead of the tractor cleans up from 30 to 40 acres of brush from 30-year-old apples in a 10-hour day, after the brush has been forked into the centers during weather that may have been unfavorable for pruning.

Thinning often becomes very tedious. As an incentive to faster work at this task we have occasionally paid thinners at so much per tree. A competent, alert foreman is essential to the success of this practice but its trial is often justified.

Harvesting of a big crop often seems to lag unnecessarily, especially if probable freezing temperatures are near. These conditions have prompted us to try the plan of paying apple pickers by the crate, the rate being three cents this past season. This cut the harvest cost about 20 per cent. Closer supervision is required to guard against bruises but the plan is very desirable. Varieties like Jonathan required three separate pickings to get the highest quality each picking date. For all varities of apples and pears the fruit-picking bucket is greatly preferred to the sack or basket at the start. The bucket slows up the picker who has used the sack, but the loss is only temporary, and the fruit goes into the orchard crate in much better shape than though handled in the sack. Farm trucks back directly to the pile in the farm storage if storing orchard run, or, if grading directly from the orchard, the truck stands at the grader until emptied, meanwhile the haulers return to the orchard with another empty truck. Cheap trucks are used for this purpose and, where tractors or horses and mud boats must be used, or where trailers are used with this power, cheap trailers are available or can be made to save harvest labor.

Where the packing house floor is on the ground level the unloading and reloading into, and from the packing house, presents a problem. In handling about five thousand bushels of plums annually as well as that many cherries, we devised a packing-house table, rigidly constructed, equipped with swivel, ball-bearing castors with rubber tread. These are pushed to a truck whose level the table top approximates, then loaded and either sorted there on the table or pushed under the sky-light for sorting. The netting or covering of the basket is likewise done on the table, from where the fruit is loaded directly onto the truck without having set in the dust near the floor, and without having lifted it down to, and up from the floor. Small items like this, when multiplied many times during the day have a tremendous effect on the morale of our help as well as upon ourselves.

Cheap farm trucks were referred to above. The motor car and truck industry has, until the past year or so stepped up its production and sales to the point of throwing many trucks into the junk yard that still have many serviceable miles in them with not excessive upkeep. We employ a mechanic whose job it is to maintain these trucks, together with the road trucks (which are purchased new, because of their marketing schedules which they must maintain), tractors, sprayers, and other machinery. Each sprayer is completely overhauled every winter on the principle that a few unnecessary hours spent in checking moving parts on winter days makes a cheaper maintenance than preventable breakdowns during the spraying season when pests wait for no man.

Records are kept of labor and materials used in each orchard, as well as those used in maintaining the major pieces of equipment. Yield records are kept of each orchard and performance records are kept of the equipment thus itemized.

The purpose of this discussion has been to compare different methods in their costs and their results, rather than

to set these costs as a standard for any other grower to be guided in his operations. Conditions vary in different fruit sections, but if our discussion has brought out any suggestions stimulating in your mind a different angle on your one particular problem or several problems then our time has not been spent in vain: for, perhaps no other agricultural business is made up of as many details as is fruit growing, each one of which is very vital to the success of the individual grower's business. If deciduous fruit production is to maintain its rightful prominence in America we must, as growers, consider very carefully before omitting the essential practices, but, instead, we should endeavor to minimize the cost of the necessary operations as far as is possible or at least practical.

TUESDAY EVENING

January 3, 1933

PRESIDENT CARPENTER: I will ask Dr. Raymond A. Pearson, President of the University of Maryland, to say a few words of welcome.

DR. PEARSON: Mr. President, Ladies and Gentlemen: We are more than glad to have you with us. We know something about what you are up against. When you were getting ready to come to this meeting only a few days ago you did not know who you would find here. In these days of rapid changes we are being surprised constantly to discover that the one we expected has met with some mishap, and he or she could not fill the engagement.

We have all been out in the cyclone. It struck some of us pretty hard. I want to congratulate the fruit growers, truck crop growers, and florists and others and the persons supplying them with various materials upon the fact that so many of you can be here. What a time for misunderstandings this is, when we are physically sick, or mentally sick. Misunderstandings come up right away, and I don't know where they are worse than they are in connection with this tax problem.

I was interested to read something from David Lawrence which was merely a repetition of something President Hoover had given previously to the effect that the entire cost of the essentials in the operation of the Federal Government is no more than the Federal Government collects in taxes on cigars and cigarettes, something like $445,000,000 a year. But here we are wondering about the increase of taxes and why it all is. But those essentials are only 15 per cent. of what the Federal Government is spending. Some ten years or so ago it was 30 per cent. Changes enough there for misunderstanding, aren't they?

We who are interested in appropriations can see it. There is a misunderstanding about the Federal Farm Board.

We hear a lot about half a billion dollars thrown to the winds and no benefits. Is that right? Aren't there some benefits? Haven't they done a lot towards promoting co-operative organizations? Furthermore, haven't they got a half billion still intact in the United States Treasury? We don't hear anything about $600,000,000 appropriated by Congress, as far as I know, serving no other useful purpose than to supply a certain city on the western coast with water. There ought to be somebody analyze that, and tell who pays it and who gets the benefit of it. Misunderstandings are flying around thick and fast.

The Department of Agriculture is accused of spending hundreds of millions of dollars for the benefit of the farmer; when the figures are analyzed we find the Department of Agriculture is spending hundreds of millions of dollars to build roads for everybody to use, and lots of other public services, some of which apply more to people who are not farmers than those who are, and spends only about $13,000,000 directly for the benefit of the farmers of the country.

Then we are coming to realize now that most of our taxes anyway go into the local districts. Some of my friends out in Iowa recently have shown me results of their studies along that line. Dr. Patterson is engineering some similar studies for this State. I think you will see them soon in printed form. In Iowa there came a widespread complaint against extension work because of the terrible expense. The director of extension found that his extension work was costing the average farmer in the State just 32 cents a year; not as much as it was costing the average farmer to go to one protest meeting. When that misunderstanding was cleared up there was no difficulty in that particular source.

What I am trying to say is that this University stands for the promulgation of the truth, hit where it will, but it

will certainly clear up misunderstandings and help to prevent wrong conclusions and a lot of unnecessary agony. And a university today that is doing its duty is searching always for new facts, new truths, and then sending them out so that the people may meet the difficulties, the enemies that are coming on them from all directions, whether they are high taxes, and goodness knows they are too high; we all want to see them reduced, or whether it be a new insect or a new plant disease, or a new soil trouble. We are trying to find and to give out the information that will help keep people on their feet; help them to do well in their life work.

We had Dr. Pearson, from Cornell, here to speak to the extension people recently. He had a good deal to say about the collapse of commodity prices, about gold, how we need to find more gold if we stay on the present currency system in order to bring about a better balance.

But he told us one thing that is good enough for me to repeat, and it is this: that when the tide turns, and, of course, it is going to turn, prices on agricultural products will be, if not the first, among the very first to turn upward, and among the very most rapid in their travel. And that is shown through his studies as almost an immutable law. It has been proven time and time again after panics that the raw materials produced on the farms in particular will be the first ones to feel the impulse and will be the ones to get the greatest benefit. And that is encouraging. That very thought is going to help a lot of people to stand the gaff and look forward with more and more confidence to the days that will come, and they will help us to make our prayers more and more earnest that the coming of little better days will be speeded.

That is my very earnest wish for you who are engaged in such an important branch of agriculture. It is the wish of the University of Maryland for you. We are indebted to you for help in many ways; particularly, as I just told Mr. Carpenter, I hope he realized how much we owe to him

personally and to some few others of you in particular for having engineered the movement which has brought into existence this splendid horticulture building. I know you know it is good as far as it goes, and you feel it ought to be equipped completely. We all feel that way. I have a detailed statement from Doctor Beaumont which shows that the better part of $100,000 is needed to put refrigerating plants into this building, and to provide equipment. Well, I hope the time will come when the Legislature of the State of Maryland will feel it can provide that money. Not only that, but additional funds for putting up suitable greenhouses over near the new horticulture building.

We know you have your interest in helping to secure that equipment for the new building. You are interested in it because it is for the best for the State of Maryland, and this particular subject, to be held on a high plane in this State with the aid of equipment which will be the equal of what could be found even in larger States. Larger States may have more specialties, but we hope that we will be able to equal those larger States in a few specialties, and horticulture is one of those.

Thank you very much for coming. I will take advantage of this opportunity to invite you all to come back again as soon as you find it convenient.

PRESIDENT CARPENTER: Horticulture is divided into many activities. One of the most pleasant of all of these is the vocation of floriculture. We have with us tonight Mr. William Ekas, who represents the interests of the florists of Maryland.

MR. EKAS: Mr. President, Ladies and Gentlemen: Representing the florists as I do, the profession or vocation dates back to the Garden of Eden, in which Adam was the first gardener. I also pay you fruit growers a very high compliment when I say that Eve was the first one in charge of the orchard.

Realizing that the orchard industry is rather a hazardous occupation, it has been the subject of much misunderstanding and there has been much economic distress. I want to assure you that the florists and nurserymen and others engaged in floriculture have experienced exactly the same difficulties. Our problems are identically the same, even though we are handling and producing different products. They both emanate from the earth. They are both subjected to weather diversities for their development and production.

The florist or flower grower has the advantage over the fruit grower in so far as he is enabled to produce certain conditions by artificial means. But those advantages also bring difficulties, which in their proportion are greater than those which prevail in the orchard industry.

There is just as vast a difference between seeing flowers in the retail flower shop attractively arranged and developed to perfection, emanating from the greenhouses through the labor and care of the growers, as seeing fruit in the retail store and the trees in the orchard.

The florist is an accessory to nature. He provides beauty during a time when nature is not working. Under those circumstances he is charged with the responsibility of producing that which enables the world to live better, to beautify its habitations. Visualize the world without flowers, without shrubbery, without decorative greens of any description. Take an ordinary house built in the open without any trees or surrounding decorations. Take that same house and put a few evergreens, a few hardy azaleas, or some flowering plants around it. It changes it from a house to a home.

The University here has been very kind to us in the last year, permitting its facilities to be used, and the faculty have given us every assistance in developing and putting on a short course in floriculture for the benefit of the florists. Within the next month we will have another of the same nature, practically the same as you men have held here,

and of a decided benefit to our industry. The possibilities of improving both fruit and flowers are yet unlimited. The higher the quality, the greater the return. We should all strive continually to improve our quality and output, and it can only be done with the assistance of theoretical knowledge and scientific facts which are presented and made a part of our education in a group of this kind.

The control of insects, of which the florists have plenty, is identically the same as with you. They may not be black spot, or aphis, but they are pests equally as destructive, and for the knowledge we have been given we are most appreciative.

According to the figures of the 1929 census there were 366 florists, nurserymen, and bulb-growing establishments within this State, covering an area of approximately 10,000 acres. Over 3,000,000 square feet of greenhouse glass has been erected and is in operation producing flowers. The sales from the production of that output approximate $2,800,000 in 1929. Value of the land, greenhouses, and equipment devoted to producing flowers is $5,425,000. That is the taxable basis from which the State derives an income. To what extent that is devoted to horticulture and floriculture, I have yet to learn. There are approximately 2,200 employees in that group furnishing employment continuously, because with very few exceptions there is no off season in the growing of flowers. It is a continuous performance and must be carried on continuously in order to be profitable, deriving $2,800,000 from the sale of the products, which means that there is that much money circulated within the confines of the State, and many of our products are shipped outside the State. A number of growers are shipping their products all over the country, carrying the name of Maryland wherever their products may be used.

It behooves the fruit growers and florists to combine their intersts for the development of this particular work. We have much in common. Dr. Pearson, on behalf of the

florists I want to assure you that we as individuals and as a unit are wholeheartedly in favor of the projects as you have outlined them, and want to compliment you on the progress which has been made in the development of the University of Maryland. We appreciate the facilities which you have placed at our disposal and assure you that when we come down here we do so with the greatest pleasure, because we know when we come here we are welcome, and I hope the time will come when the faculty will not be handicapped in the development of their purpose by the facilities which are now incomplete.

PRESIDENT CARPENTER: Progress in flower culture and fruit growing would be impossible were it not for the splendid research work which has been carried on at our University. We feel very warmly indeed toward our director, and I am going to ask Dr. H. J. Patterson, Director of Maryland Experiment Station, to say a few words:

DR. PATTERSON: Mr. President, Ladies and Gentlemen: I believe we have every reason to be optimistic as to the future of horticulture and for farming in general, but in order to reach all that we would like to acquire in horticulture, we must follow out the admirable principles set forth in that splendid address by Mr. Bryan this afternoon on peach growing; that is, to so conduct our business as to produce a high quality product and to have a good net return on that product.

Now, that is the secret, I think, of the success in our work, and the thing that we must aim to follow out in a very emphatic way. We are hearing a good deal about taxes and taxation these days. We are all hoping to have our taxes reduced, or at least shifted to some other person. I believe the best thing that we can do is to try to make a greater net profit on our business so that we can take care of those so-called burdens of taxation. I doubt whether any of us wants to give up any of the service that the State

or Federal Government is now rendering us. In fact, I expect that if we actually stated our desires we would enunciate a whole lot of additional services we would like to have the State, the county, or the Federal Government render.

How are we going to get these additional services? How are we going to maintain the services they are rendering now and still not have something taxed in order to produce it? I believe from that standpoint we must work arduously in order to have a greater net profit in our business in order to meet these financial problems in connection with taxation.

I believe we do not always apparently appreciate the fine business in which we are engaged, and the splendid opportunities that farming in all of its branches offers. So I would admonish all of us to be more optimistic and to follow out the injunction to grow better fruit, improve the pack and reduce production costs.

PRESIDENT CARPENTER: Our country has been suffering most severely from a serious curtailment of her international trade. This affects our fruit growers everywhere because of the fact that they have built their industry to supply the world's market. We have with us tonight Mr. Samuel Fraser of the International Apple Association, representing the fruit-growing industry of the entire world. Mr. Fraser will address you on "The American Fruit Grower and International Trade."

THE AMERICAN FRUIT GROWER AND INTERNATIONAL TRADE

SAMUEL FRASER,

Rochester, New York.

Mr. President, Ladies and Gentlemen:

I am a fruit grower presenting certain features of the statistical and financial situation. The International Apple Association, of which I am assistant secretary, has members resident in twenty countries. World problems go over our desk daily and we have had one constant turmoil for the last six years—one problem after another.

In recent years the United States annually produces somewhere around the equivalent of 30,000,000 to 34,000,000 barrels of commercial apples and has placed from 21 per cent to 23 per cent of them abroad. Boxes are included in the above.

Captain John Smith came to Virginia some 300 years ago. A brief inspection soon demonstrated that the prospectus of the company undertaking the settlement of the colony of Virginia had magnified its desirability. He had heard about the gold nuggets which were to be picked up free, the pleasure which was to be derived by an existence in Virginia, which was to be a delight forevermore. The English idea was that somewhere in this territory there was a short passage to China, and since the Spanish galleons coming up the Gulf Stream to make Europe always had to come along this coast, it was a good place for the English to lie in wait to raid the galleons as they passed by. John Smith started to collect herbs and wood, and with these he loaded the ships which had brought supplies. This started the export business. Capital was borrowed from England and by 1915 we still owed Europe about $3,000,000,000. During the World War we were able to sell the Allies in Europe a lot of things they needed. Great Britain

sent over $5,000,000,000 worth of American stocks and bonds to pay for supplies purchased at very high prices; her total purchases equaled $11,000,000,000, and at the close of the war Great Britain owed us 851,000,000 pounds, or about $4,000,000,000. Other countries were in debt to us, and, instead of being an exporting nation sending supplies over to other people to pay for interest and payment on our debts, we became a great creditor nation with some $11,000,000,000 owing us (not including war debts placed with interest at $22,000,000,000 more).

When the war closed the different nations thought it incumbent to devise some means of strangling Germany. They arranged a very heavy indemnity, which they knew at once was incapable of fulfillment. Great Britain suggested that everything be cancelled. There was owing to her about $15,000,000,000. She was ready to cancel. The leading economists said that was the sound thing to do. There was not enough gold to pay, because there were only $11,500,000,000 of gold in the monetary systems of the world. Some $22,000,000,000 has been mined or is known to have existed, nearly half of it being lost or in hiding. Of the monetary gold, the United States today has about $4,600,000,000. France has about $3,300,000,000. This accounts for nearly $8,000,000,000 of the $11,500,000,000; 175,000,000 people in the United States and France have 70 per cent of the supply; the other 1,600,000,000 people have 30 per cent of the supply. Of the missing gold, India may hold $3,000,000,000. We do not know just where the rest is.

Now, as to our payments of interest and principal on money owing to us, we insist we do not want supplies to pay for this debt; we do not want service; we want gold. This cannot be done. That position maintained since the close of the war has brought on a strangulation of international trade, which is one of the factors (there are a number) from which we are suffering.

In 1913 the exports and imports of the world (100 countries) were about $41,596,000,000. By 1929 they had reached

$68,520,000,000. This year they are going at the rate of $26,000,000,000. Exports from all countries of the world are now about $1,000,000,000 a month. If we had no inhibitions and restrictions, we should be proceeding at the rate of about $55,000,000,000 a year instead of $12,000,000,000 in our exports between nations. That is a very big factor because for every export there is an import, which includes freight, and the two would total over $110,000,000,000. The exports of merchandise of the United States were $7,900,000,000 at the peak. For five years we have reached about $5,000,000,000. Last year, 1932, it was $1,617,877,000.

Now, that is a big drop. It affects shipping and transportation as well as the producers. The Conference Steamship Lines in New York in 1931 laid up 330 ships; in 1932 they laid up 220 more. Every ship would carry 200 cars of freight. Do you wonder where our trade is gone? Do you wonder why our railroads are only moving half of the volume of two years ago, and only a third of their capacity?

We are not sending goods abroad because those people have nothing to pay with that we will accept. For a few years we loaned them money with which to buy the things. We loaned them as high as $1,000,000,000 in a year to buy things from us, and England stood on one side and said, "Why, sure you can have prosperity if you lend them the money to buy the goods. But the money won't last to keep it up." Now we have stopped. We didn't lend a nickel last year.

We are novices as a creditor nation after being over 300 years a debtor nation. The complete turn around is hard to understand, but we are coming to some important understandings now.

For 300 years Great Britain has been the financial center of the world. Thomas Gresham was the leading political financial advisor for Queen Elizabeth. He said, "If you want to make England—the Great Britain you are talking about—do two things. First, have sound money. The next thing is, train men in international trade." So he started and built the Royal Exchange in London. He said, "If

somebody has something to sell, buy it. If somebody wants a thing, sell it. Finance them, and send your ships and deliver." England, until the last few years, never had $600,000,000 of gold at one time, and she built up a position in the world where the world owes her $20,000,000,000 on the former value of sterling.

At the present time in the United States we have $4,600,000,000 of gold, and we are not using it. America has missed her call. She was not ready when it came. If you go back through the pages of history, there have been six great nations who were traders — the Phoenicians, the Romans, Spain, Portugal, Holland, Great Britain, and the turn came to America—and for over ten years she has turned her face backward instead of forward. She stayed on a nationalistic policy when an international policy was necessary if she was to take her position in international trade.

A great many of our problems, especially in the fruit business, are consequent on the action which has been taken since 1920. We passed a tariff in 1922, and then in 1929 we called for a revision of the tariff, supposedly in the interests of agriculture, and it was enacted. You had only to go to Washington and see the way that tariff was put through. The barriers were put up. All effort was devoted to checking trade. If we are going to change our position, well and good. I believe we are headed for a change very rapidly.

But if we maintain our present international policy, then the advice of one of our Senators at Washington to me, last month, is correct. He said, in answer to a query, "There is too much wheat, too much cotton, too many jackknives, too many apples, too many pears. The growers can do what I did with my pear trees—pull them out." He was utterly opposed to any consideration of international or other debt problems looking toward retention of our export trade thereby, his position being, "If they want our apples or our pears, let them buy them and pay for them,

and let Europe pay her debts." This position maintained will force the readjustment he indicated. Loss of exports will necessitate the pulling out of trees and a long hard road of readjustment. If this is our course, then the readjustment confronting us is serious.

Now a few words as to our domestic financial condition. In 1929, according to the National Industries Conference Board, we owed in the United States about $203,000,000,000, the Federal Government owing about $17,000,000,000. Federal indebtedness was reduced from a peak of about $26,000,000,000 to $17,000,000,000, and now some men are stating you can achieve an industrial solution by going into debt another $5,000,000,000.

The National Industries board placed the wealth of the United States—your farm, my farm, my automobile, your furniture, your house, and all the other things in the United States put together—in 1929 at $362,000,000,000. Today they place the value on the same basis at $200,000,000,000, and an indebtedness of like amount. Our national income has fallen from about $90,000,000,000 in 1929 to less than $40,000,000,000 in 1932.

In June, 1932, the Controller of the Currency placed a call on the banks for their statements. This June statement of the United States banks came out in December, 1932, and it showed a shrinkage in deposits. It showed, however, deposits of $45,000,000,000. We are not broke, but we show a loss in deposits of $11,000,000,000, with one bank in every four bankrupt since 1929. In Great Britain no banks went bankrupt. In Canada, since 1925, no bank went bankrupt. In France and Italy no bank went bankrupt. True, it is stated that our banking system is in a better situation than it was. There was an $82,000,000,000 shrinkage in a year in the value of stocks, etc., on the New York Stock Exchange. We have gone through some trying experiences.

How about internationally? The country that handles the international exchange of the world has an income of about $400,000,000 a year from this work. Great Britain

has had that job. She has handled it very well, showing the value of long training and knowledge, and we may include wisdom.

There are two things necessary for success. Not only capital—money—but also keeping it moving, and Britain has handled gold skillfully. We fell down on our chance. It came in 1920, and what did we do? We didn't put it over. We have the ships. We tied them up. We did not go out and buy and finance. We did throw money away, and now there is $235,000,000 worth of goods lying in Chile, Peru, Brazil, not paid for because there is no machinery for transmitting the money back. All that American capital, with several hundred millions more, is idle in South America.

We exported $1,617,877,000 of goods in 1932, and we imported $1,322,665,000. The world owes us $295,212,000 on this year's business. Our exports exceed our imports. How shall we be paid? Poland owes us money, for instance. Poland has come to the point where gold is so short that nothing can come into the country unless goods to balance go out. Take Brazil, or the Argentine; they are not sending out enough goods to pay for their imports. In certain countries which are off the gold standard their governments announce categories for business and the payments received for their exports are used according to plan. The Federal Government has first call for payment of its debts, the State government second, banks third, certain corporations fourth, and the men who handle a particular business, which happens to be in category No. 5, finds that there is nothing with which to finance their foreign business. Any exports made are used to pay Government or State or bank indebtedness. So trade ceases. Barrier after barrier is erected—quotas, trade restrictions, mounting tariffs—all to prohibit trade among nations.

Now, we and the other nations have gone ahead on this proposition and worked ourselves into an impasse. Great Britain put on four shillings six pence a hundredweight duty, in connection with the Ottawa conference, on our

apples and on our pears, and what happened? From August to October, 1932, we were moving apples to Britain at the rate of 80 per cent of the same period in 1931. During October, and until the duty went into effect on November 16, 1932, we were moving at the rate of 125 per cent of 1931. People wanted to get their apples over so they would be in England before the higher duty went into effect. In the next four weeks we averaged just 29 per cent of the volume of last year, and this in a year when England has a short crop of apples, when we should have been moving in at peak. The duty has nearly closed the market, with Canada moving apples in duty free.

We did not send an apple direct to France in 1927. She got her apples in Rotterdam and in England. In 1928 we sent a few. By 1931 we sent in 400,000 barrels and 877,000 boxes, and the French woke up. We sent them into France because France had money; her prices were high. If anybody has a lot of gold and it is free to operate, naturally prices rise. But France started to put on restrictions. She put a quota on, and this year we have sent in just 45 per cent of last year's total shipments of barrels and boxes, and of barrel apples alone not 10 per cent. That quota works. We go into Poland on a permit. We cannot enter Roumania or Italy. Spain declared an absolute embargo; Peru put an embargo on; Argentine placed restrictions. Brazil has been open but is unable to transfer the money. And so we run into obstacles.

One thing more. Great Britain, on September 21, 1931, went off the gold standard, and what happened? Exchange started to fall. A year elapsed, and the pound, instead of being worth $4.86 was worth $3.30 to $3.50. Until the 18th of October, 1932, Britain had been trying to hold sterling stable. When support was withdrawn, sterling started to fall. By November 30 last, it had reached $3.14½ cents for a pound, the record low for a century. We were pushing England for payment of the war debt. Sir Norman Angell was asked the question, "Is England going to pay?"

He said, "Yes, she is going to pay, but you can't afford to take it."

A surprising thing has happened. As sterling fell, American prices fell. That includes our apples and all our farm stock. As we pushed England to pay, prices of other things slipped. By June, 1932, prices of farm commodities were at their lowest in years. By September they had increased 11 per cent. Then we started the pressure on the pound. Prices started to fall, and as sterling fell 9 per cent, our prices of farm commodities fell 11 per cent, and continued to fall all of December even after the British had paid on December 15. We are losing in price adjustments fully $3,500,000,000 in order to get $125,000,000. Can you regard that as sane? I'd like to see it justified. We lost in the last year $2,000,000,000 in taxation to get a possible $206,-000,000. We are not internationally minded, and we have not been trained in the economics of the situation. Britain is on a managed currency, and she is managing. Scandinavian currency is allied to the pound, and naturally as the pound slipped you would expect their prices would rise. Sweden, Denmark, Norway, all show increases from 118 to 123. But in England prices have not risen more than two points, and if the increase in prices does not register there, the decrease must register here where they buy.

France would like to make the franc the international coin; Britain would like to maintain her position. The fight is on now for the coin that will be dominant. That is one of the problems in front of us. Britain wants to go back to gold. She wants a stable coinage. She knows the soundness of her whole business life rests on a sound coinage. She would like to get back but debts and the whole interwoven problems with them confront her. The solution of these confront us as well as Britain.

In regard to our internal debt problem, some have suggested one way out and some another. Recently the free coinage of silver was again presented as a solution. We can buy silver at 25 cents an ounce. Are we going to send a 25-cent bill out and say it is a dollar? How long are you going to take silver dollar bills that are worth 25 cents

apiece in payment of your bank account if you think you can get gold? You see, every time you start one of these propositions you are in trouble, because the law of compensation will work. You will want your bank account paid in gold. That silver money would be unsound on that basis, and unsound money and sound money cannot live together. The unsound money will run the sound money right off the market. We are running into a lot of trouble if we start on a lot of half-baked ideas.

I am not here to tell you the way out. I don't know. I am impressed with the problems going over our desk all the time—the inability to pay. Take Germany, for instance. She is anxious to buy, with a short apple crop, and she would buy, but the gold cannot leave the country. If you want to leave Germany, want to take a trip, they will let you take $50.00 to spend on the trip, and as soon as that is gone you cannot go any further. Somebody wants to buy $10,000 worth of American apples. The answer is no, $3,000 worth is all you can buy. That is the problem. If you want to trade with Poland, you cannot bring an apple in until you sell so much glue and so much of this, and that in exchange. And we won't take them. The triangular trading is all right on paper but it won't work. We must do direct business, if we are going to restore trade.

Now, what will we do? I believe that we must right about face, assume our responsibility, if we are going to prosper. We are part of the world. A glorious mission confronts us. We are going through the fire. May we come out purified and able to serve humanity. Is there not enough of the spirit of service in America to say, "This is our day, this is our chance, this is our opportunity to lead"? But, ladies and gentlemen, when you go and see and talk to some of the men whom we have elected, and you get the point of view which they say is the reflection of all—they have not heard. That is your responsibility. Have you let them know? Have you let them know where you are? Have you let them know what you want done? Are we thinking or are we drifting? If I have one message, it is, let us get headed right. Let us turn right and we shall prosper.

PRESIDENT CARPENTER: One of the problems that has been confronting the growers in the Cumberland-Shenandoah Valley has been the movement of what we can call a very undesirable variety of apples. Many are still growing Ben Davis which have been because of public favor, ruled out of almost every market in the world, including our own. At present the Republic of Argentina is perhaps the largest consumer of Ben Davis, and recently they set up restrictions which prevented the movement of our fruit to their country. These restrictions resulted in the loss of considerable movement of our fruit, and it was felt very keenly because of the utter absence of other markets to which we might ship.

This year an effort was initiated through the Eastern Apple Council which led to the movement of a quantity of fruit to Argentina. This movement was made possible through the efforts of a committee headed by Mr. J. Andrew Cohill. The efforts of that committee were greatly aided by the Director of Extension, Dr. T. B. Symons, and we will ask Dr. Symons to say a few words to us on "The Argentine Embargo and Its Effects on Our Growers":

THE ARGENTINE EMBARGO AND ITS EFFECTS ON OUR GROWERS

T. B. SYMONS.

College Park, Md.

Mr. President and Friends: I think it fair to say that we do not appreciate the significant action taken under the decree issued by the Argentine Government, and that in itself goes back to a large story. Aside from the appearance of the Mediterranean fruit fly in this country which initiated the original decree, it was then accompanied by the provision that the barrelled apples should be wrapped from the United States, and obviously, we of the Eastern Seaboard could not practically wrap our apples and thereby have them sent into the Argentine Republic.

I will not take the time to outline the various moves, conferences, and factors that had to be eliminated in reaching the goal attained. Suffice it to say that we were finally able through the efforts of an export representative to have the Argentine Government suspend temporarily that provision for two months and to consider and respond to the request that they send two inspectors to this country for the purpose of examining these apples that they desired be wrapped in barrels.

Mr. Waterman, representing the exporters, is a "go-getter." After knowledge of all the facts surrounding the case, he sent his son to Argentina, he communicated with growers there as well as the representatives of the government, and with our solicitations to the Secretary of State sent wire after wire, cablegram after cablegram, supported by the Secretary of Agriculture and the Secretary of State, and we finally in October received a cablegram from Ambassador Bliss that they would suspend the paper wrap decree for two months, and that they would send two inspectors to New York.

These inspectors came, landing on November 30, and between that period and the 17th of December, 15,000 barrels of our apples were inspected and transported to that country, unwrapped. The price of the Ben Davis apple was raised from 50 to 75 cents by virtue of lifting that load off our market.

It is a significant fact that we have almost been totally ignorant of this vast international trade and the necessity of backing up our representatives, and as Mr. Fraser has said, informing our representatives concerning the manner in which this foreign trade affects every farmer and fruit grower in America. This start represents what your committee, in co-operation with the Government officials, in co-operation with the Apple Shippers Association through Mr. Phillips, and in co-operation with the exporters as represented by Mr. Waterman, has obtained.

But we feel that we have attained more than that, because we were able to have these two representatives come to Washington on December 1 to meet our fruit growers. The committee is indebted to the fruit growers of Pennsylvania, Maryland, and Virginia and West Virginia for coming in and meeting these representatives, and for the courtesies that were extended to them. There was nothing more practical than to have those men visit our apple section and to have demonstrations made like Mr. Carpenter and Mr. Cohill conducted in their packing houses, to show them the whole process of grading, packing, and barreling our apples, and showing them the impracticability of wrapping them for export.

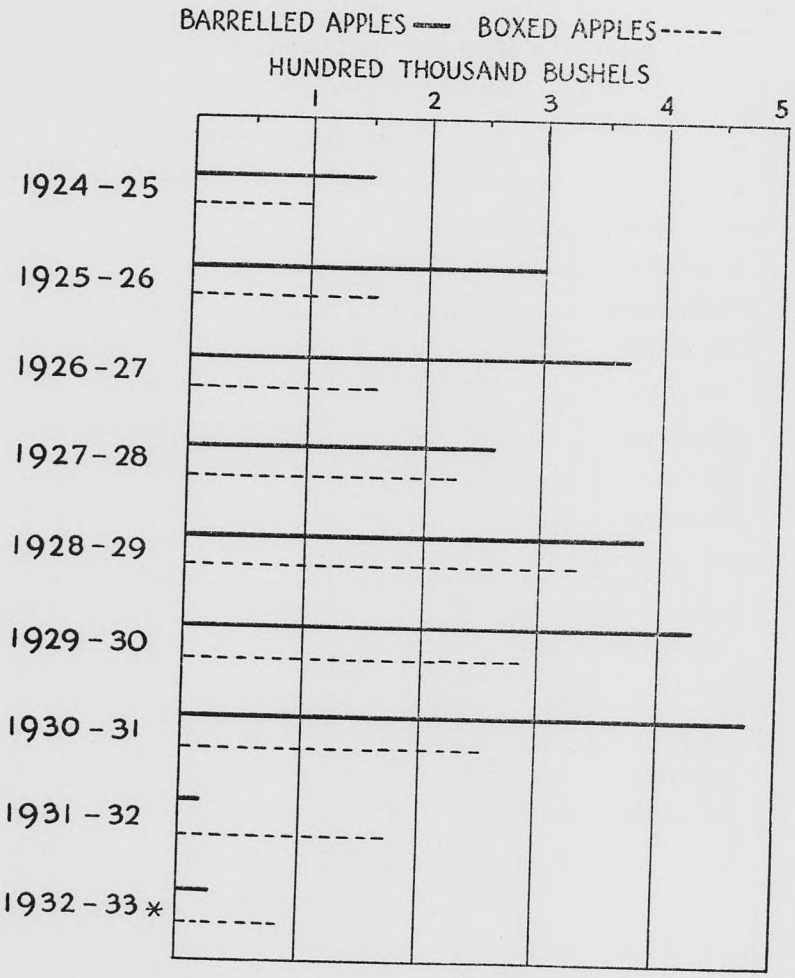
We are indebted to the exporters and the growers because the money for the expenses of the inspectors was paid by 10 cents a barrel assessment on barrels exported. But the assurance of funds for the inspectors was promised by Mr. Waterman and the State Department exacted it before the inspectors left Argentina. And incidentally, after returning from a very pleasing reception by Pennsylvania, Virginia, Maryland, and West Virginia, they returned to a conference with the Secretary of Agriculture, and there explained that they hoped this Government would reciprocate in sending inspectors to Argentina for assisting in the transport of grapes into this country, and that situation is now being negotiated.

I am glad to say for Secretary Hyde and his associates that they agreed that with the authority from Congress, they could send inspectors to Argentina to assist in the transport of grapes into this country.

See what this export business means to this country. See what relations with these countries, either tariff or understandings mean to the fruit industry of this nation.

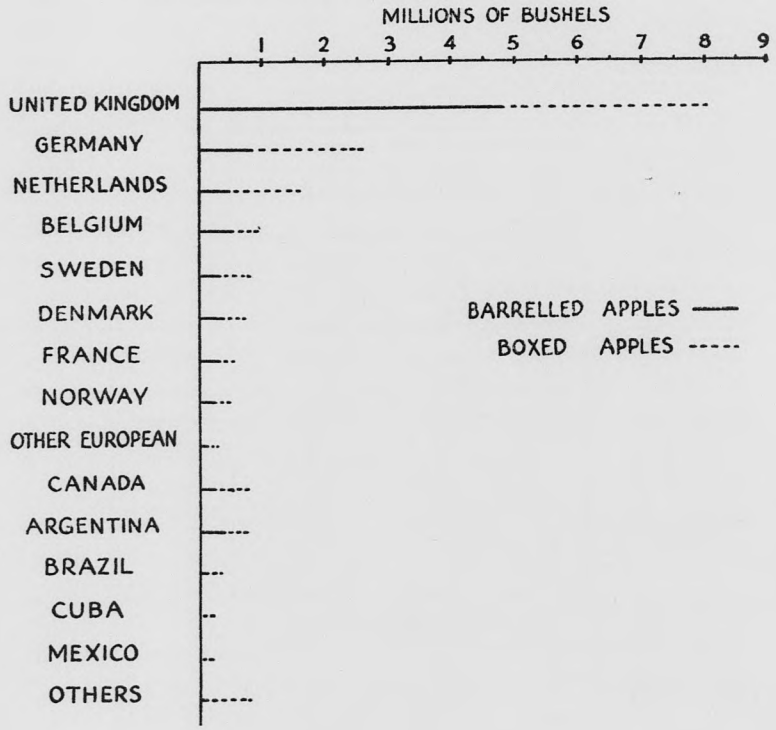
We talk about France. She has been accepting our apples, but in 1898 they passed a law preventing the importation of fruit carrying the San Jose scale. Last year when we shipped so much fruit to France, 147,000 boxes and barrels, they saw too many apples we believe, and thought they should call a halt on the importation of American apples.

U. S. EXPORTS TO ARGENTINA OF BARRELLED AND BOX APPLES FOR THE YEARS 1924-25 TO 1932-33.

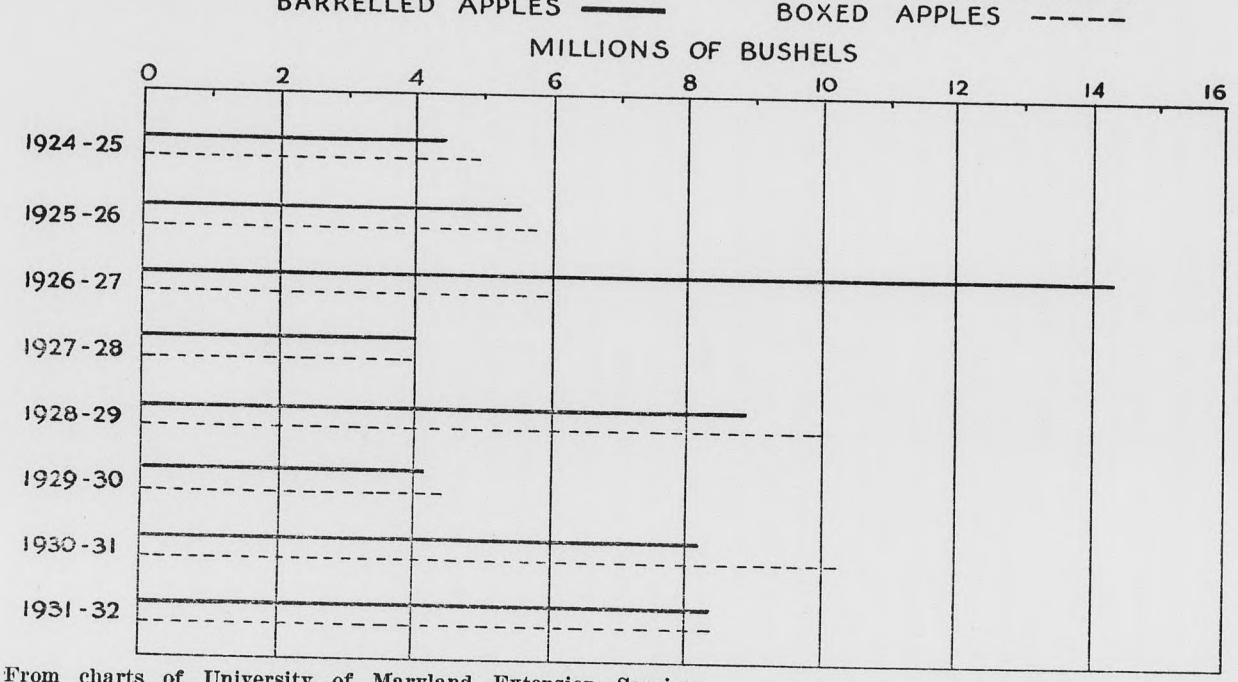


* INCOMPLETE FIGURES

APPLES—U. S. EXPORTS TO PRINCIPAL COUNTRIES
(5-YEAR AVERAGE, 1926-27 TO 1930-31).



U. S. EXPORTS OF BOXED AND BARRELLED APPLES FOR THE YEARS 1925-26 TO 1931-32.



From charts of University of Maryland Extension Service.
Figures compiled by U. S. Bureau of Agricultural Economics.

At any rate, the impressions are they dug up this old 1898 law and enforced it. They said, "We are going to have not only the quota, but we are not going to have any apples come in that contain San Jose scale." And so this year, in addition to the reduction quota we lost from the point of San Jose scale. But even so, France, is a small proposition. It is only a bagatelle compared with Netherlands, Germany, and the United Kingdom, and I think we can say that the shipment of fruit to the United Kingdom this year so far as inspection and regulations are concerned, has been fairly liberal. It has been the tariff and exchange that has affected that situation, and we seem to have two things to overcome.

One is the national policy as affected by the tariff, and the second is the regulations that are set up from the standpoint of insect pests and plant diseases, both of which we must give very careful thought.

We were glad insofar as our Extension Service, Dr. Beaumont and his associates and all of us here at the institution are concerned, to have worked with your committee in seeking to aid the Government officials as well as the export representatives in opening up this market. We hope that Argentina will continue to suspend their decree. We hope that we may be able to send inspectors there to assist them in their grape transportation to this country, so that the market next fall for Ben Davis as well as other apples may be as clear as possible under conditions. The significant fact of all of this to me is that we each and every one are deeply interested in the national policy affecting the exports of our fruit, and I respectfully submit that locally and individually that we all give more careful attention, first to the quality that we are producing, because we have been unfair to the European markets in times past in the quality that we have sent across the water. We deserve some of the difficulties that we experienced. But we must see to it that we endeavor to exchange on a fair basis with those countries if we expect to continue in the export business.

WEDNESDAY MORNING

January 4, 1933

PRESIDENT CARPENTER: "Biennial Bearing of Apples" will be the topic discussed by Dr. John R. Magness, Principal Horticulturist, U. S. Department of Agriculture, Washington, D. C.

BIENNIAL BEARING OF APPLES

J. R. MAGNESS,

Washington, D. C.

The problem of the biennial bearing of apple varieties is apparently as old as apple growing itself. The tendency for apple varieties to set a very heavy crop one year, and a light crop or no crop the year following, has been studied and discussed by apple growers and horticulturists for many years, yet we still have the biennial or alternate bearing condition with many apple varieties and in most sections of the country.

While there is a marked difference in the tendency of different apple varieties to bear crops annually, it should be emphasized that all varieties tend toward biennial production. We know of no variety which will regularly produce a crop of apples following an extremely heavy crop the season before. To that extent all varieties may be considered biennial. However, there is a marked difference in the tendency of different varieties under ordinary commercial production conditions to bear regularly. Among the important varieties which are most pronounced in their tendency to set heavily one year and to produce lightly or not at all the year following, would be included the following: Baldwin, York Imperial, Yellow Transparent,

Wealthy, Oldenburg, and Golden Delicious. All of these varieties tend to set very heavily when a full bloom is produced with favorable pollination conditions. This excessive crop is generally followed by a crop failure.

A second group of varieties which normally set fairly heavy crops and which are pronounced in their biennial bearing habit under average eastern orchard conditions, are the following: Delicious, Grimes Golden, Stayman Winesap, Jonathan, and Ben Davis. While this group is easier to maintain in regular bearing than the first group, they are likely to become biennial unless handled carefully.

A third group of varieties which produce moderate crops of fruits but which fruit with remarkable regularity would include Rome Beauty, McIntosh and Rhode Island Greening. These varieties normally do not set excessively heavy crops and are fairly easy to maintain in regular production.

It is to be emphasized that the varieties which tend to set the heaviest crops of fruit are normally the ones in which the biennial tendency is most pronounced. Varieties which usually set only a moderate crop normally tend to produce annually, although they may become biennial following an unusually heavy set in any one season.

The fundamental cause of the failure of apple trees to form fruit buds for the following year when bearing an excessively heavy crop appears to be the lack of sufficient nutrients, probably primarily sugars, in the trees. Under Maryland conditions fruit buds of most varieties are apparently formed between the middle of June and the end of July. Whether or not fruit buds for the following year are formed during that period depends on the nutritional conditions within the tree. If an excessive amount of fruit is present on the tree, the nutrients formed in the leaves will apparently go into the fruit to such a large extent that an insufficient quantity is left for fruit bud formation. If fruit buds do not form during the summer period, no crop can be produced during the year following.

The amount of sugars and other plant nutrients which may be formed in the tree depends largely upon the leaf system of the tree. As you know, the leaf is the place in which the true plant foods are formed, and the quantity which may be formed favorable conditions of moisture supply and light depends upon the leaf surface of the tree. Consequently the amount of leaf surface in relation to the amount of fruit on the tree largely determines the formation of the buds for the season following.

During the past two or three years my associates, W. W. Aldrich, L. A. Fletcher, and myself have been conducting detailed studies to determine the relationship between the crop in one season and the formation of blossom buds and set of fruit for the season following. These studies have been conducted on York Imperial, a variety typical of the strongly biennial group. Careful records were made of the number of leaves and numbers of fruits set on a considerable group of York Imperial trees in Western Maryland in the summer of 1931. These leaf and fruit numbers were recorded by large limbs on each tree. No thinning was done on any of these trees. In the spring of 1932, the blossoms formed on these trees were recorded. Results are shown in Table I:

TABLE I.

Fruit-leaf ratios on unthinned York Imperial apple trees, 1931, and bloom record, 1932.

Number of Leaves Per Fruit 1931	Per Cent of Spurs Blossoming 1932
11-20	0.4
21-30	12
31-40	33

It is apparent that in these unthinned York Imperial trees from 30 to 40 leaves per fruit, set normally on the trees, were essential if fruit buds were to be formed in sufficient numbers to give a fair crop the following season. The results show clearly that when very heavy crops are set

on the trees with less than 20 good leaves per fruit, little or no fruit bud formation for the following season can be expected. Even in a variety like York Imperial, if only a moderate bloom occurs and there is only a moderate crop of fruit on the tree, fruit buds will be formed for the following year. It is the tendency of these varieties to set very heavily and to leave a relatively small leaf system per fruit during the crop years that gives them the pronounced biennial habit.

In order to determine whether or not it is possible to influence fruit bud formation in the York Imperial by thinning off the fruit, a series of trees carrying heavy crops were thinned at intervals during the season of 1931. Careful counts were made to determine the approximate leaf-fruit ratios before thinning on each of the major branches. All results reported here were on trees thinned to leave approximately 100 leaves per apple after the thinning. Results secured in percentage of fruit bud formation were as follows:

Trees thinned to 100 leaves per apple, June 4:

Number Leaves Per Fruit Before Thinning	Per Cent Fruit Bud Formation Spring of 1932
11-20	17
21-30	26
31-40	29

Trees thinned to 100 leaves per apple, June 18:

11-20	18
21-30	36
31-40	23

Trees thinned to 100 leaves per apple, July 1:

11-20	15
21-30	9
31-40	25

The above figures show that extremely heavy thinning on June 4 and June 18 resulted in a marked increase in the amount of bloom in the Spring of 1932, even on branches carrying a very heavy crop or more than one fruit per 20

leaves. On unthinned trees, branches in the series from 11-20 leaves per fruit formed only 0.4 per cent bloom the following Spring. Heavy thinning to leave approximately 100 leaves per fruit resulted in sufficient bloom to give a moderate crop in 1932.

All of these experiments were conducted on trees which were in moderately good vigor. Other evidence indicates that if the trees are in a very devitalized condition less favorable results from thinning would be secured.

Thinning to the degree practiced here, which was to leave approximately one fruit to each 20 growing points, markedly reduced the amount of crop on the tree. While the apples became large and well colored on these thinned trees, the total yield in bushels was only approximately half that of unthinned trees carrying a comparable original crop. Unless the thinning is sufficiently heavy to rather markedly reduce crop yields, it is questionable if it will have any effect on fruit bud formation.

In other experiments we have endeavored to determine the time when fruit bud formation may be influenced with different varieties in the Shenandoah-Cumberland-Potomac Valleys. While these results are incomplete, they indicate that on Jonathan and Delicious a small percentage of the buds may be influenced as late as July 15. With Oldenburg (Duchess) and York Imperial, on the other hand, July 1 represented about the latest date at which an appreciable percentage of the buds could be influenced. With Rome Beauty at the other extreme a fairly large percentage of the buds could be influenced as late as August 15. Thus it is apparent that if fruit bud formation in such varieties as Oldenburg and York Imperial is to be influenced by thinning, the thinning must be done in early June. The more vigorous the trees of any variety, apparently the later the fruit bud formation in those trees may be influenced.

A question of the effect of drouth conditions on fruit bud formation is an important one in this section at the present

time. Observations and some experimental data would indicate that if the trees become dry during the period of fruit bud formation the tendency is to increase rather than decrease the number of fruit buds formed. Successive drouth conditions may leave the trees in a devitalized condition and more likely to become biennial bearers. The immediate effect of drouth on fruit bud formation, however, appears to be to increase rather than decrease the percentage of buds formed in most varieties.

The question may well be asked, "Is it practical for the grower to follow the type of thinning done experimentally in order to secure annual cropping on the trees?" If such excessive thinning had to be done every year, it is questionable if it would be economically feasible. Approximately three hours per tree were required to thin medium sized 22-year-old trees in these tests. The point should be emphasized, however, that once the biennial condition is broken in these trees relatively less effort is required to maintain the trees in annual production. As long as only a moderate bloom is occurring in the trees with a moderate set of fruit they will tend to remain in annual production with only limited thinning necessary. There seems little doubt but that with at least the higher quality varieties such as Delicious, Jonathan, Stayman Winesap, Rome Beauty and others, whatever thinning is necessary to induce annual bearing should be practiced. Such thinning will increase size, color and market value of the fruit, as well as aid in securing regular production.

To summarize, then, the methods believed most helpful in securing and maintaining a tree in annual bearing, (1) we would stimulate the tree to a vigorous growth condition by fertilization, pruning, and if available, irrigation; (2) to break an established biennial condition, heavy early thinning in the on-year will probably be necessary. Careful thinning thereafter in trees which set a heavy crop should maintain the trees in this condition.

PRESIDENT CARPENTER: The topic, "Common or Cold Storage at the Orchard? Their Cost," will be discussed by Mr. Meredith P. Reed, a well-known Indiana fruit grower.

COMMON OR COLD STORAGE AT THE ORCHARD? THEIR COST.

MEREDITH P. REED,

Vincennes, Indiana.

Several factors have entered into the marketing and distribution of fruit during the last several years over which the grower has had no control, but he has been vitally affected. About the time that the bushel basket started to become popular saw the advent of the truck which has had a lot of influence in our present marketing scheme, in most sections of the country at least, and at near the same time there was a let-up in speculative buying at harvest time on the part of the fruit handlers, which resulted in glutted markets at that time and a depressed price. As a consequence many growers throughout the country built common storages or remodeled old buildings into storages, and some few have built cold storages as a means of lengthening their selling season and at the same time get a little more of the consumer's dollar for themselves. The following is our experience for two years with each type of storage:

We operate 210 acres of apple orchard in Southwestern Indiana in the center of a new orchard district, with no large towns very close. Vincennes has a population of 17,000, our nearest large towns are Evansville, Terre Haute, Indianapolis and Louisville, Ky., all within a radius of 130 miles. Fifty per cent. of our apples, the past few years, have moved by truck, the balance by car lot. We do not cater to retail sales except the automobile trade that comes to our door. We do not even solicit the grocers of our town. Our business is entirely wholesale and we do not deliver apples to other towns. We have hired trucks to make

deliveries of large orders at a distance, but we do not have equipment for that purpose.

Prior to 1928 we had a lot of loss in our off grade and drop apples and odd lots of No. 1 that we kept at the packing-house with the expectation of selling in a short time, but a good part of the time could find no buyer. Consequently they would have to be resorted or sold at a sacrifice. After the picking season was over and unsold fruit had been placed in a local commercial cold storage, we still had a demand for fruit at the packing-house, so we would have to haul fruit back to the orchard to supply this demand, and as commercial storage costs were, in our opinion, excessive, we decided to build a common storage.

After getting all the information possible from experiment stations that had worked on this problem and writing to various growers that had common storages, getting their plans and suggestions as to improvements and visiting several houses in different States, we built a storage 50 x 108 feet inside, using bow string girders in the roof construction, giving us an unobstructed floor space, with a twelve-foot ceiling with seven inches of granulated cork between the joists, the walls were constructed of interlocking hollow tile, thirteen inches thick with five air spaces running horizontal. The floor was of dirt with a concrete walk-way the length of the building through the center. One 4 x 7 foot door at each end and on one side.

To get away from the large number of small ventilator openings recommended in most storages of this type, we had one thirty-inch vent opening at each corner at the ground level, with a 24 x 30 inch air duct extending 35 feet into the house along the side wall. In this air duct we had a 27-inch fan to suck in the outside air. Four openings in the duct with baffles distributed the air to all parts of the building. In the ceiling we had four vents 36 inches in diameter leading out through the roof with a trap door to each. With this system we could change the air in the room every four minutes.

In the bottom of each air duct was a concrete trough holding three inches of water, and we also had spray nozzles in the duct so that we could circulate the air through a water spray to raise the humidity when needed; also on top of this duct for the full length of it we constructed an ice bunker with slat floor. The fans were arranged in such a manner that without opening the outside or ceiling vents we could circulate the air inside the storage, or if using ice, to circulate the air under the ice and through the drip. We used refrigerator doors throughout.

This house was built at a cost of $8,000 and had a capacity of 20,000 bushels when filled with field crates, which we use exclusively. There is about 30 per cent saving in space when using crates rather than baskets.

The first fall we used this house we began apple harvest with the thermometer near the 100 mark, and it continued abnormally high all of September. The lowest temperature we could get in the storage at this time was around 65 degrees and most of the time it was above 70 degrees. At one time when we were putting in a large quantity of apples and the outside temperature was high, we hauled ice and used five tons per day for several days, and never reduced the temperature one degree, but we were able to hold the temperature stationary at about 65 degrees. That was the only time we ever used ice.

It might be of interest here to quote some observations of C. E. Baker of Purdue Agricultural Experiment Station, made at their experimental storage. In one room he used ice and in the other natural air circulation for the months of September and October. During September the mean temperature of the iced room was 56½ degrees, the natural air room 70 degrees; during October the mean temperatures were 48 and 55 degrees, respectively, and the cost of the ice on a bushel basis was 24.4 cents.

Quoting Mr. Baker, he says: "As early as September 15 the difference in favor of the iced room could be noticed.

Grimes in the warm room were almost competely yellowed and beginning to show a great deal of rot, while at this time the Grimes in the iced room were still green and firm.

By September 21 considerable internal breakdown and rotting was noticed in both rooms, but the amount in the iced room compared to that in the warm room was very small.

On about October 1 thirty bushels each of Grimes and Jonathan were shipped to Mitchell from the warm room. Of these, 20 per cent of the Grimes and 10 per cent of the Jonathan were unsalable.

Counts made on fruit in the iced room on October 19 showed 7.1 per cent unsalable Grimes and 1.1 per cent unsalable Jonathan. By this time all the Grimes had been removed from the warm room as they were past salable condition. The Jonathans in the warm room showed 11 per cent unsalable fruit on this date."

Our experience was that we could not get our storage temperature lower than ten degrees above the outside minimum, and could hold that for only a short time if the outside temperature went up. The ground temperature of the dirt floor, which is about 55 degrees, acts to lower the temperature in the early fall, but during the winter it acts as a stove and will raise the room temperature above the desired point. To illustrate this, one winter a sudden blizzard hit us. When it came our house temperature was 34 degrees. The outside temperature went to 18 degrees below zero and stayed below 10 for three days, while the storage temperature did not go below 31 degrees. The ground heat offset the outside cold.

After the first year's operation we came to the conclusion that this type of storage was not practical in our latitude for such fall varieties as Grimes, Jonathan and Delicious. Rome Beauty if held until after Xmas got so mealy that they were hard to sell. Winesap held well for as late as January. But our loss from decay and shrink was at least 10 per cent for all apples stored and all fruit had to be resorted before packing.

Early in the summer of 1931 we saw a large apple crop in prospect with a probable poor demand, and with commercial storage rates at that time of 30 cents per bushel we figured that we could convert our house into a cold storage and save money. We got prices on refrigerating machinery and insulation and made estimates on the probable cost, with-holding our decision until we saw how the summer apple crop went into consumption. When the bottom dropped out of the summer apple deal we decided to go ahead, and in six weeks' time from ordering the materials the job was completed.

We applied two inches of cork board to the walls with plaster on each side and two layers of concrete on the floor with two inches of cork between, built a cork board partition in the middle of the room, giving us two rooms 47 x 53 feet. We did not add any insulation to the ceiling, as it already had seven inches of ground cork in it. We installed the compressor in our packing shed 25 feet distant. We hired one man from the firm where we bought the compressor to supervise the installation, and did all the work with our own men.

Ours is the direct expansion ammonia system with overhead coils down the middle of ceiling, and side wall coils. Each room works independently, so that in the early fall or late winter we can cut out the room that isn't needed. We still kept the ventilating arrangements of the common storage, except the air ducts and ice bunkers, so that during the winter when outside air conditions are right we can shut down the ice machine and save some operating costs.

We also built our own humidifying device by using an old one-cylinder spray pump with a small electric motor to pump spray, through which we circulate the air by means of fans. This works fine and we maintain a higher humidity than most commercial storages.

The operation of the storage is automatic and only needs inspection to check temperatures and oil, and maybe the

slight adjustment of a valve now and then to regulate the flow of ammonia to the coils. Anyone capable of keeping an old gasoline engine going on a spray rig could operate the plant after the principal of operation is learned.

The refrigeration for this building was figured on the basis of maintaining a temperature during September and October of 35 degrees and temperature of 32 degrees for the balance of the winter, and those are about the exact temperatures we maintain. When we are putting in warm fruit, 35 degrees is about as low as we can get, and if we put in as much as 1,500 to 2,000 bushels in one day the thermometer will go up close to 40 and the compressor will run 24 hours a day, but after the storage is filled and the latent heat taken out of the fruit, we get the temperature down to 31-32 degrees and the compressor only runs from one-third to one-half the time. This depends, of course, upon the outside temperature and the heat leakage through the walls.

Last year the cost of electricity per day for the different months was as follows:

September average, $5.98 per day, 8,000 bushels of fruit put in.

October average, $7.28 per day, 13,725 bushels of fruit put in.

November average, $4.43 per day, 500 bushels of fruit put in.

December average, $3.09 per day.

January average, $2.16 per day.

February average, $2.20 per day.

The average consumption of electricity per day for the present season to December 23 amounts to $4.30 as compared to $5.20 last year, due to cooler weather this year.

The cost of this storage house complete was $14,000. This

includes the cost of the original common storage plus the cost of converting into a cold storage. A saving of several hundred dollars would have been made had we built the cold storage to start with.

For last year we figured the cost of operation as follows:

Taxes on building	$ 90.00
Depreciation on equipment and building	560.00
Interest on investment	700.00
Interest and depreciation on 12,000 field crates	635.00
Electric bill for season	698.40
Oil for machine	10.00
Insurance on building	53.20
Total cost for season	$2,746.60

It cost us 12 cents per bushel on 22,300 bushels as against 25 cents per bushel in a commercial storage. Of course some of these apples could have gone into a commercial storage on a short term rate, but our local storage would not quote this rate until we built our house. Then the cost of hauling both ways would have to be added, which would amount to about six cents.

It is hard to estimate just what this storage is worth to us. An example of where we benefit is in the sale of our off grade fruit. The past two seasons we have obtained from five to twenty cents per bushel more than our neighbors, for the reason that we were equipped to hold them a longer time if necessary and had the nerve to ask a higher price, knowing that if we did not sell them today we could in a very short time, even if it became necessary, to put them in the cooler for a while. This past season's price on number two and drop apples at picking time was generally 65 cents per bushel, packed, at the orchard. We did not sell any below 75 cents, and the ones we held until the other growers were cleaned out moved at 85 cents to $1, most of them going out in bulk.

I previously mentioned that we store in field crates. As

the fruit is brought to the packing shed it is washed, sorted, and sized just the same as if it were to be packed in baskets for immediate shipment, but is run into field crates and trucked to the storage, where it is ricked nine crates high on two-inch slats with a two-inch air space every third rick. The cost of putting the fruit into the house is exactly the same as packing and loading into a freight car, as we use the same crew to do either. It costs us between 1¾ to 2 cents to bring this fruit back out and repack for shipment or sale.

We have found that a fresh pack moves at a higher price and the customer is better satisfied than he is with an original package that has been in storage several months.

Last year, an orchardist of the Middle West, that has his own cold storage and packs his fruit fresh after storage, was shipping to Chicago on consignment. He also had fruit in a commericial storage that was packed at picking time. A car of each arrived on the market at the same time and he averaged 15 cents per bushel more for the fresh pack.

Our conclusions in regard to the common storage is that the most serious limitation, under Southern Indiana conditions, is the impossibility of securing a satisfactory storage temperature until the later part of October, and by this time most of our fruit is harvested except the very late varieties.

During the past several years the weather during September and early October has been exceedingly warm, with only an occasional cool period of short duration. Under these conditions it was impossible to secure sufficiently low temperatures in our common storage to prevent the rapid ripening of fruit harvested at this time of year. Consequently just at the time a good storage is needed the common storage fails to function. After late October the outside temperature is usually sufficiently low that it is possible to maintain a satisfactory storage temperature from then on, and the common storage proves satisfactory for the

varieties harvested after this time. Meanwhile if Grimes and Jonathan have been carried along in common storage at the temperatures prevailing during September and October, they will have ripened so rapidly that they are in poor condition before November 1. and their storage life is practically completed.

It is for this reason that the large grower cannot afford to place fruit intended for a delayed market under these conditions. It would probably prove more economical under ordinary circumstances, for the larger grower to ship his best grades of fall apples to cold storage or put them on the market and depend upon common storage only for the inferior grades of these varieties or for varieties harvested during October.

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Our conclusions regarding a cold storage at the orchard is that it is entirely practical and efficient and a money-saver if filled to near capacity each year. We have found it has proven as successful as we expected it to be; that the fruit can be left on the tree longer for size and color and goes into storage the same day as picked, or most of it does; that part of the storage space can be used twice, that is, early apples such as Grimes and Jonathan can be put in for thirty to forty-five days, then brought out and the space filled with late varieties; that we have a more complete assortment of grades and varieties for our trade to select from than the grower not so equipped; that our fruit is right here to show a prospective buyer and we made the sale rather than some clerk in a distant warehouse; that one does not have to have an engineer to run the plant.

I do not urge other growers to adopt these methods of holding fruit, as each one has an individual problem, and I have not attempted to outline methods of procedure that may be followed by others. I have merely given you some of our observations of this problem that may be suggestive to those of you having similar problems.

Question: What depreciation do you figure on the ice machine?

Answer: 10 per cent.

Question: What do you pay per KW hour for electricity?

Answer: We pay a minimum charge of $9 per month and 3 cents per KW hour. We also use electricity for stationary spraying and washing and packing.

Question: If you were to build another storage, would you use the same materials in the construction?

Answer: No. I would use a cheaper wall construction with a heavier insulation of cork. The more insulation one uses the cheaper will be the operation of the refrigerating system. Any material that protects from the weather would be alright if enough insulation was used on the inside.

Question: Do you use your storage for early apples or peaches?

Answer: No. Only for fall and winter apples. It takes several days for the refrigerating system to absorb the heat out of the walls and floor, and the short time that these items would be in storage it would not pay to start up the plant.

WEDNESDAY AFTERNOON

January 4, 1933

PRESIDENT CARPENTER: Dr. E. N. Cory, State Entomologist, will discuss "Pertinent Facts with Regard to Insect Control in 1932."

PERTINENT FACTS WITH REGARD TO INSECT CONTROL IN 1932

ERNEST N. CORY,

College Park, Md.

For several years we have been running codling moth emergence cages at various points in the State in an attempt to reach conclusions with regard to the average time of emergence. Corrugated paper bands were placed on the tree in the fall, in which codling moths were allowed to spin their cocoons, and later placed in screen cages in the orchard. Daily emergence records were made from these cages in the spring. These records have been plotted on charts (charts displayed) and in general they show that there is very little variation in time of emergence at the various points in the State over a period of years. Emergence records made inside and outside a packing house at Easton show that there is a distinct lag in the cage inside the house, indicating the necessity of maintaining a thorough coverage of the fruit and foliage up to the time of the last spray, July 15. In general, peaks of emergence in 1932 for Hancock, Frederick, New Windsor, College Park, Easton, Salisbury and Berlin show only a slight lag at Hancock, but a distinct lag at Berlin in an orchard about three miles from the ocean. This points to the influence of the ocean in retarding the spring emergence, which agrees with the statement frequently made by Hopkins with regard to the

retarding influence of the ocean in the spring upon all biological phenomena.

If an orchard is adequately equipped so that the entire acreage can be covered within the four-to-five-day period, adherence to the dates of starting spraying as sent out by the spray service ought to give protection against the codling moth.

CODLING MOTH SURVEY IN COMMERCIAL ORCHARDS

The appended tables show the results achieved this year in codling moth control in the principal commercial orchards of the State. The results on the Eastern Shore are poor due to the extreme infestation in one of the Eastern Shore orchards where the condition was so bad that an arsenical spray had to be advised on August 15.

Results of Codling Moth Survey in Western Maryland

Orchard No.	Variety	Per Cent Wormy	Per Cent Sting	Per Cent Clean
1	Grimes	7.20	5.35	87.45
2	Summer Rambo	0.0	.96	99.40
	Wealthy	0.0	.40	99.60
	Jonathan	.30	.40	99.30
	York	.74	2.90	96.36
	York	1.90	5.80	92.30
3	Wealthy	0.0	1.70	98.30
4	Wealthy	.81	2.10	97.09
	Grimes	3.12	5.10	91.78
5	Delicious	7.04	5.02	87.94
6	Grimes	5.52	2.23	92.25
7	Jonathan	.89	3.63	95.48

Average clean fruit for Western Maryland—94.7.

Results of Codling Moth Survey in Central Maryland.

1	Black twig	1.35	7.007	91.60
2	Grimes	.985	4.05	94.96
	Jonathan	2.74	4.01	93.25
3	York	5.38	31.21	63.50
4	Rome	4.27	8.73	87.00
5	York	5.90	10.30	83.80
6	York	0.0	6.48	93.52

Average clean fruit for Central Maryland—86.8.

Results of Codling Moth Survey on Eastern Shore Maryland

1	York	9.33	25.40	65.27
	Delicious	8.60	32.20	59.92
2	Stayman	12.70	54.30	33.00
3	Stayman	4.61	6.95	84.44

Average clean fruit for Eastern Shore—60.63.

THE ARSENICAL RESIDUE SITUATION

Owing to the arsenical residue tolerance established in 1925, a complete revision of the Maryland spray calendar was necessitated that year. Since that time we have not advised any arsenical application after July 15 except in the one case cited above, and I think that it is a distinct tribute to our growers that no arsenical applications have been made later than that date. The analyses of apples going into commerce have been carried on by the Pure Food and Drug Laboratory of the State Department of Health on pre-harvest samples, except in the case of 1930. In that year a laboratory was set up at Hancock and 346 car-lot samples from 31 shippers were examined there. Of these 9 samples carried 0.01 grains per pound, and 3 samples from 0.01 to 0.02 grains per pound, but of these only one sample was found above 0.015 grains, the tolerance set for that year. At the State Department of Health laboratory samples from 44 orchards were analyzed. Seventy-eight of these samples represented fruit ready for shipment and the balance represented orchard samples. Three car lot samples contained as high as 0.01 grains per pound, and 8 showed 0.015 grains per pound, or higher. This fruit was brought into grade by washing. The other orchards that ran above the tolerance were brought within grade at harvest time through weathering and the use of brushes.

In 1931, 514 pre-harvest samples were taken, and of these 45 showed arsenic in excess of the tolerance of 0.012. Fifteen of these samples were brought with the tolerance at harvest time by two companies utilizing washing machines, and the

balance came within the tolerance due to weathering up to time of harvest.

In 1932, 407 orchard samples were taken representing 83 orchards. Of these 59 showed analyses in excess of the arsenical tolerance of 0.01 grains per pound. Eleven of these samples were taken from orchards which had washing machines available and 9 of the samples that showed excess represented two re-analyses of the fruit of three varieties from a single orchard where it was found necessary, owing to the excessive codling moth accumulation, to recommend a spray on the 15th of August. Due to heavy rains just prior to picking, these samples finally came within the tolerance. The balance of those that showed excessive residues at the pre-harvest period also came within the tolerance.

I believe that it is a remarkable tribute to the efficiency of the Food and Drug Commissioner that there has never been a case of seizure of Maryland apples. The co-operative spirit displayed by the entire Department of Health in this endeavor could not possibly be exceeded, and it ought to be a matter of congratulation to the State that this exceedingly helpful spirit exists between the State departments. Between the State Department of Health, the University of Maryland, and the Food, Drug and Insecticide Administration under the direction of Mr. Walsh, an excellent co-operative spirit has also been evident.

In order to export fruit to France this year it became necessary to examine each apple in 2 per cent of each car-lot destined for France. Most of this work was conducted at Hancock by Mr. Graham. It takes approximately four hours to examine each apple in 2 per cent of the car load, though of course, if scale is found in the first lot examined, that car is rejected for a sanitary certificate. Mr. Graham inspected 49 cars, 33 of which were passed and 16 rejected. Two cars certified, but which were not examined by Mr. Graham, were rejected at the point of entry, but so

far as we have been advised, none of the 33 cars passed by Mr. Graham were rejected.

EXPERIMENTS WITH SUBSTITUTES FOR ARSENATE OF LEAD AND FOR THE USUAL FUNGICIDES

In co-operation with Dr. Jehle, Mr. Graham conducted test to determine whether Sulfocide can be substituted for lime sulphur or lime sulphur plus Bordeaux in the last spray and whether calcium arsenate can be substituted for arsenate of lead. Six plots were used for the experiment as follows:

Row No. 1—Check.

Row No. 2—Sulfocide, used as the fungicide and arsenate of lead used as the insecticide.

Row No. 3—Sulfocide used as the fungicide and calcium arsenate used as the insecticide.

Row No. 4—Lime sulphur was used as the fungicide up to the third cover, in which Bordeaux mixture was used, and arsenate of lead as the insecticide.

Row No. 5—Fungicide same as No. 4, calcium arsenate used as the insecticide.

Row No. 6—Fungicide as in Rows Nos. 4 and 5, insecticide lead arsenate, 3 pounds to each 100 gallons of spray material, whereas in all the other rows only 2 pounds of the insecticide were used per 100 gallons of spray.

The spray dates for each row were the same, namely; dormant March 15, pink April 15, calyx May 13, first cover June 2, second cover June 18, and third cover July 7.

The check row was a fair demonstration of what would happen to an orchard if it was not sprayed at all. Records show that 67 per cent of the fruit was scabby, 17.9 per cent was wormy, with only 25 per cent being clean.

Where Sulfocide was used as the fungicide there was an average of 5.6 per cent of the fruit scabby, whereas where lime sulphur and Bordeaux were used as the fungicide only 2.22 per cent of the fruit was scabby.

There was very little difference in the amount of codling moth injury in the plots where calcium arsenate or lead arsenate were used as the insecticides. The average per cent of wormy fruit in the calcium arsenate plots was 4.14, and the average per cent in the plots where arsenate of lead were used as the insecticide was 3.81.

Further tests along these same lines will be conducted during the coming season.

SCURFY SCALE EXPERIMENTS

A heavy infestation of the scurfy scale, *Chionaspis furfura,* in the orchard of Mr. Amos Reeder, Boonesboro, afforded the opportunity for the testing of a number of new tar washes and oils in comparison with the usual application of concentrated lime sulphur. The materials were applied in the spring before the buds began to swell and the results were taken 30 days after the spray was applied and again after the hatching period was over. The average of these results are shown in the accompanying table.

Material Used	Amount Used Per 100 Gal. Spray	Total Number Scale Counted	Per Cent Killed
Concentrated lime sulphur	12 gal.	1,103	10.30
Dendrol	5 gal.	994	80.10
Gro-All Emulsion	5 gal.	1,173	79.80
Tarolene	5 gal.	1,400	84.16
Kleenup oil	5 gal.	1,260	88.67
Barko	5 gal.	1,004	86.50

From these results it is apparent that the tar washes show no significant increase in lethal quality over some of the oils of the usual type being used in Maryland orchards. It is also apparent that repeated applications will be neces-

sary in order to complete the control of this insect and accordingly further tests will be run during the coming year.

SPRAY PROGRAM FOR 1933

The Cumberland - Shenandoah Conference has recommended that a lubricating oil emulsion, 3 per cent oil plus ½ per cent cresylic acid, be used this year, starting with the dormant period and ending prior to the appearance of the first green leaves. This is recommended primarily as an economy measure and also in order to check the scale infestation which appears to be greater in the adjoining States than in Maryland. The records just given for scale inspection would seem to indicate that Maryland conditions are fairly good, but in the interest of economy and in order to have our recommendations conform with those of other States we have agreed to this change. If you use a proprietary miscible oil you should ascertain from the manufacturer the exact dilution and the necessity for the addition of cresylic acid to the spray. In some cases it may be unnecessary or incompatible with the commercial product.

Another change that is advocated in the spray program calls for the addition of light pressed fish oil at the rate of 1 pint to each 100 gallons of spray in the second cover spray. This oil should contain less than 5 per cent fatty acids in order to be safe for use on the foliage. This addition is made to insure a more complete coverage of the fruit and foliage for codling moth control. The balance of the spray program is essentially the same as last year and will be available for distribution in the course of the next few weeks.

In conclusion, I wish to state that the information I have been giving you is largely based upon the work of my associates in the department. I believe that we have as fine and competent a lot of men working on the entomological problems of the State as you will find anywhere. If you do not know these men, it is to your interest to get acquainted and

utilize their knowledge. They are anxious to be of service to you and I know can be of distinct help.

PRESIDENT CARPENTER: Three practical and successful fruit growers will talk on the subject, "Our Problems—How We Plan to Correct Them."

COMBATING CODLING MOTH

FRANK W. FARNSWORTH,

Waterville, Ohio.

In 1929 the codling moth infestation in our orchard was about 25 per cent; in 1930 it stepped up to about 40 per cent, and in 1931 to 50 per cent, especially on McIntosh. We decided to tighten up on this fellow by two major methods: First, by sanitation and banding; second, by the old practice of spraying. Realizing, however, that greater control must be derived from our spray application, we decided, at the suggestion of our State Entomology Department, to operate emergence cages for the timing of these codling moth applications. Previous to the season 1932 our codling moth applications had been timed exactly with the emergence cages located only forty miles east of us, but we suspected a variation in moth emergence at this distance as compared with emergence in our orchard. This variation did prove to exist, differing four or five days.

Plans for more thorough spray application brought up the point of opening the tops somewhat more, thus making every point on the tree accessible for spraying, Judicious pruning will accomplish this result without excessive removal of bearing wood. In August of 1931 two dozen twenty-year apple trees were banded snugly with untreated bands. These were made of tough paper, impregnated with burlap to strengthen it. One end of the band was slipped over the nail head to remove it for removing larvae every two days. The larvae were counted into a small jar con-

taining strips of corrugated cardboard, in which they spin up in from twelve to twenty-four hours. Larvae continued entering these untreated tree bands until November 10, about 500 total. The strips thus populated were supported by small cord to nails on the inside and back of the emergence cage. The emergence cage is made by enclosing the edge of a board with a screened frame. The frame has its lower side sloping from outer edge toward center in chute form to facilitate removal of dead moths in spring when counts are made of moth emergence. As a check against our method of handling the larvae for emergence we secured larvae in corrugated paper from our Experiment Station. The station larvae emerged about five days earlier than the larvae collected in our orchard the fall previous. The cages thus containing the moths were secured to posts set one under the drip of the branches, the other midway between the drip and the tree trunk, and both of them facing southeast. This arrangement approximates the light and exposure of the average moth's location throughout the orchard. During the late winter and spring the loose bark was scraped from all apple trees having such bark, and the scrapings gathered in a canvas or burlap beneath the tree and slotted to fit snugly around the base of the tree trunk. These scrapings were burned at once or collected in empty lime-sulphur cans to be burned soon. An ordinary long-handled hoe is used for the bulk of the scraping, with a three-cornered box scraper and a blacksmith's hoof knife used for the smaller areas and the crevices in the crotches. Thoroughness at this point is very essential, as the larva will actually burrow slightly to force himself in between the tree trunk and an apparently very tight bark flake. At 15c per hour the scraping cost on 23-year-old trees ran about 7c per tree, plus a banding cost of 5c for labor and material, or a total cost of 12c for scraping and banding.

Throughout May a close watch was kept of codling moth emergence in the cages, which started May 26, with the peak occurring about June 1, requiring that the first cover spray be applied June 7 to 9.

Hatching commenced in the apples about June 7 to 8, indicating that in two weeks some of these worms would be leaving the apples. Accordingly the bands were all in place by June 20, applying all bands before that date, but as near to it as possible to avoid loss of strength due to possible rains. The moths were emerging in decreasing numbers, ceasing entirely June 27, at which date the second cover spray was applied. Timing of this second cover spray was determined by the fact that the moths had hatched four or five days previously, together with the fact that the bait pans had caught their peak amounts about three or four days previously.

The midsummer application was likewise timed with regard to the moth emergence July 20 to 24, and the bait pans' indication that moths were flying heavily during these same dates. Thus, the emergence cages showed the "peak" emergence dates so that the spray could be applied just ahead of these dates. The bait pans likewise showed the "peak" emergence, but more especially did they show the continual flight of the moths throughout the warm summer evenings, and the consequent necessity of maintaining a constant coating of lead over the fruit.

Treated bands of 2-inch width and of 4-inch width were used on trees in close proximity with scarcely any variation in effectiveness, each width catching about 30 larvae per tree. These bands are always removed after apple harvest and burned. No damage from bands is apparent to the tree trunk after two seasons' use. However, they are applied at different points on the trunk than where placed the previous season. All apple trees of sufficient age for rough bark are banded.

Throughout the four codling moth sprays 3 pounds of lead per 100 gallons were used. Various brands of lead gave apparently equal results. Spreader lead and no-spreader lead gave apparently equal results. Various strengths of excess hydrated lime were used ranging from

no excess to 10 pounds per 100 gallons. Results were apparently equal in each case, although this represents only one season's results. Ten pounds per hundred shaded the bright portions of the apple slightly, and the heavier lime amounts made cleaning easier with a cloth wiping machine. Residue on all fruit was below the tolerance point. Spraying is done in both directions at the same time when wind conditions permit doing so. Thus a tree space is finished at one trip through. When this is impractical often it is practical to have both spraymen spray with the wind when traveling in one direction then both spray into the wind returning, and while traveling out of the drift. This plan is used with the 45-gallon pump, each man's disc having ¼-inch opening, and carrying about 325 pounds pressure, being careful to break it up with the old-style adjustable gun before it hits the foliage or fruit. Here is where we take advantage of the winter's pruning to slightly open up the tree for this "shooting through" to cover the near side of the tree and fruit *clear through* the tree. The calyx application was applied from the tank top and from the rear platform. One-half of an orchard was sprayed through the entire season from the tank top and from the ground to see if the ground method helped our control. The only apparent difference in this method was to require more time and material than tank spraying. The experience should not condemn ground spraying under certain conditions. Following is a chart showing gallonage per tree in different applications and for different age trees:

	Age of Tree								
Application:	13	23	30	27	13	45	6	45	20
Oil	10	13	15	15	5	.. .	....	....	10
Pre-bloom	3	9	14	10	3	15	2	14	10
Calyx	3	25	25	33	6	29	3	40	21
First Cover	7	25	27	31	7	34	3	44	23
Second Cover	5	17	31	20	8	25	3	35	20

Just as no one successful operation brings successful

fruit growing, in the same manner, no one phase of codling moth control will clean up a thoroughly bad infestation of this pest. Our experience indicates that, once it is well established, a program of sanitation, caging, banding, and *thorough* and timely spraying are all necessary to rid the orchard of this expensive visitor.

SAVING MONEY AND CARING FOR DETAILS

MEREDITH P. REED,

Vincennes, Indiana.

There is only one problem before the fruit grower for the next few years, and that is to stay out of the "red." All other problems are incidental.

I will enumerate a few of the things that I think it has paid us to do and some of our practices that have saved us money.

A few years ago we came to the conclusion that our packing house cost were too high so we junked an expensive Western type grader and put in one of more capacity, enlarged our packing table and put in 150 feet of roller conveyors. This was done at a cost of $1,000.00 but we saved 2½ cents on every bushel of fruit that went through the house that year on labor cost alone. On that one crop we made a saving of $1,200.00.

We think the installation of a stationary spray system has made us a lot of money. We have sprayed our orchard of 210 acres in 19 hours. This past season the average time of spraying was 27 hours for each application. The saving in teams, feed, barn space, and man-hour labor is no small item. We are depreciating the cost of this equipment very fast (20 per cent a year) as we do not know just what the life of it will be but with this heavy depreciation charge our

spraying cost for 1931 was 10 cents per bushel, this year 11 3/10 cents. We apply from 10 to 12 sprays.

After harvest each year I take the tractor, log chain and helper and go over the orchard very carefully and pull out all weak trees. Most trees that will die can be spotted one to two years in advance at this time of the year. All vacancies caused by this culling out are reset the following spring.

All empty field crates, baskets, picking bags, etc., are stored in our storage house and all codling and peach moths that emerge are caught and destroyed. Last year we caught and destroyed about six hundred moths a day during the period of emergence.

We used to practice clean cultivation with cover crops, but in recent years have used sweet clover, hairy vetch and Korean lespedeza letting it reseed itself and only discing the ground to sow a new crop or discing when the soil becomes impervious to water. Our growth under this system has been just as good as when we cultivated and the humus is not burned out of the soil.

Question: What does it cost you to pick and pack a bushel of apples?

Answer: Cost us about 20 cents per bushel loaded on cars. A labor cost of about 2 cents going through the packing house.

A SUMMARY OF IDEAS

C. E. BRYAN,

Havre de Grace, Maryland.

I was asked to sum up the remarks of the other speakers. Mr. Farnsworth gave you an excellent illustration that it never pays to spray except in the best possible way, and that falling short of proper spraying, even to effect apparent economy, is a loss in the end. I am sure

that the cost in the past year was considerably greater than any additional cost that might have incurred, to spray so efficiently as to keep codling moth out.

All orchard pests are comparatively easy to keep out, but hard to get out, if you once get them in. When we are thinking about economy in orchard practice, we want always to think of what the old economists called "broad economy." "Do not save at the spigot to waste at the bung." My earnest advice is that if you cannot take care of your orchard in the proper way it is better to cut trees out—reduce your acreage to the point where you can handle it efficiently. You will be better off in the end.

I thought Mr. Reed handled the question of economy in the right way. He is trying to reduce the cost of operation in every way, so long as he does not decrease efficiency. Mr. Reed goes through his orchard every year and cuts out weak trees. You can always spot a tree two or three years before it dies. He says he has never seen an orchard without dead trees. That is a pretty serious reflection on us fruit growers. Mr. Reed also mentioned the use of a permanent cover crop for reasons of economy. In the case of apples that would seem to be absolutely wise, and it may be that the necessity of economizing in that way, will be a blessing in disguise.

Many orchardists have practiced clean cultivation, with poor cover crops so long that their land is lacking in humus and water-holding capacity, and the planting of alfalfa or clover to break up the subsoil and supply humus, will really in the end be a great benefit.

PRESIDENT CARPENTER: We will have the report of the Auditing Committee.

MR. GEORGE C. MCCLAIN: Mr. President, the Auditing Committee report that they have examined the books, accounts and vouchers of the Treasurer and Assistant-

Secretary, Mr. A. F. Vierheller, for the fiscal year ended December 31, 1932, and have found same correct.

The motion to accept report was duly seconded and carried.

PRESIDENT CARPENTER: Next is the report of the Resolutions Committee.

MR. BALDERSON: I offer the following resolutions:

Be It Resolved, That the Maryland State Horticultural Society commend and thank the efforts of Messrs. Carpenter, and Cohill, Dr. Symons, and all others within and without the State who have helped so efficiently in the Argentine apple situation.

WHEREAS normally 40 per cent to 80 per cent of the commercial apple crop of this State is exported, and

WHEREAS under present exchange, tariff, and quota restrictions our export trade is rapidly vanishing, and sales can be made only at ruinous prices; be it

Resolved, By the Maryland Horticultural Society that a memorial be drawn up setting forth the vital need of some action to alleviate this situation, and dispatched by the Society to the Senators and Representatives from this State in the Congress; and be it further

Resolved, That a copy of the aforesaid memorial, with a notation of the action taken, be sent to the Horticultural Societies of all other States with the earnest request that they take similar action.

Be It Resolved that the Maryland State Horticultural Society request the co-operation and active assistance of the Association of Commerce of Baltimore in the advancement of the export of apples from their port and particularly to the shipments of fruit to the United States.

Be It Resolved, That we ask the co-operation of the vari-

ous Chambers of Commerce with this territory in our efforts to reopen and re-establish our foreign markets. Copies of this be sent to the various Chambers of Commerce for their records.

Be It Resolved, That the Maryland Horticultural Society assembled at their annual meeting in the Horticultural Building at the University of Maryland respectfully request the Maryland Agricultural Society, the Maryland Farm Bureau Federation, and the affiliated Farm Organizations to meet at the University of Maryland for the annual meetings beginning in January, 1934; and be it further

Resolved, That this resolution be presented to the officers of the above associations.

Be It Resolved, That we, the Maryland State Horticultural Society express our appreciation for the hospitality of Dr. Pearson and his staff during our stay at the University.

All resolutions were adopted by vote.

MR. COHILL: I want to say that these resolutions are serious. I want to impress upon the members of the Horticultural Society that they must be active and that they have to take these problems that are facing them a litle more seriously than they are doing. This is the only way that we are going to get relief. It is my understanding that 86 per cent of U. S. No. 1 fruit from Maryland is exported. This export problem needs your assistance. Make it your business to get in touch with your Congressman when you get home. Write to him. We are going to get some relief on this thing if we work on it. Take this thing seriously—discuss it a little more freely. The thing is so serious that these influences mean much to you. They are fundamental. Ask your Chamber of Commerce and Congressman to help you.

MR. CARPENTER: The next report is that of the Nominating Committee.

MR. J. A. COHILL: With the problems coming up during this year, we are going to continue with the same officers that we had last year. This work ought to continue on. Mr. Carpenter has certainly made many sacrifices to be our President and we have therefore asked him if he would not continue to be our President for another year. For First Vice-President—W. Earle Withgott; Second Vice-President —Raymond Hanson; and A. F. Vierheller as Treasurer and Secretary.

EXECUTIVE COMMITTEE

JOE HARRISON,
E. D. MCCAIN,
W. LEE ALLEN,
E. C. AUCHTER,
LLOYD BALDERSTON,
B. C. BARNES,
J. A. COHILL,
J. H. BEAUMONT,
A. L. TOWSON,
J. WALTER ENGLAR.

Report accepted by vote.

PRESIDENT CARPENTER: I reappoint Mr. H. C. Whiteford as our Representative in the Maryland Farm Bureau Federation.

PRESIDENT CARPENTER: I want to take this opportunity to thank you for the great honor that you have accorded me. It is, however, an honor that, especially in these coming years, may prove of great responsibility and I want to say at this time that it can be only by a united effort on the part of everyone belonging to our Society that we can accomplish the things that are needed.

PRESIDENT CARPENTER: We will hear from Dr. E. C. Auchter, of the U. S. Department of Agriculture on the subject "Drought Injury—Its Occurrence and Correction."

DROUGHT INJURY—ITS OCCURRENCE AND CORRECTION

E. C. AUCHTER, Principal Horticulturist in Charge,

Division of Horticultural Crops and Diseases,
Bureau of Plant Industry,

U. S. Department of Agriculture,

Washington, D. C.

All orchardists remember clearly the severe drought of 1930. During the past season drought conditions existed in many areas of the Shenandoah-Cumberland Valley fruit districts. During the summer and fall several trips were made through the principal fruit sections of this area in an effort to study the type of injury resulting and the conditions under which most severe injury occurred. In addition to general observations and orchard studies individual growers in the various States were interviewed and certain general conclusions were reached.

OCCURRENCE OF DROUGHT INJURY

In looking over this area it has been apparent that orchards on deep, well-drained soil, where the root system could go down and out, generally speaking, have withstood the drought better. If the roots are held up in the first two feet, or 18 inches, drought injury often occurs, but if the roots can go on down, when the top soil is depleted of moisture there is still a chance for moisture to be obtained.

This brings us to the question of soil types: The Hagerstown clay loam soil, Apple Pie ridge soil, and Chert soil, orchards on those three types in general, have suffered less. The Chert soil looks like crushed stone with rocks of various sizes and with organic matter dispersed in between the rocks. The roots seem to go down a long way. The top of this layer of stone acts as a mulch, it prevents loss of mois-

ture, and it seems to be a cooler soil. These types have suffered less.

Orchards on the black slate soils, which have very little organic matter in them, suffered badly this past summer. The leaves wilted badly and were not functioning well. In many of them part of the leaves fell off and the terminals died back.

Some orchards are planted in a very deep sand, where the water from beneath does not get up. Those trees, by loss of moisture through the leaves, were eventually reduced to permanent wilting because of the dry soil. The leaves fell off and many died.

Yellow and red shale soils fell in between the first and second groups. Soils in which the trees have gotten on, not well, but moderately; shallow soil, maybe 1½ feet before you get to stratified rock. They have suffered as a class this past year more than the orchards in the groups first mentioned.

The other general fact that stood out, regardless of soil types is that those orchards which have been given good care in the past, particularly through the turning under of organic matter, suffered least. These orchards stood out, whether on the shaly soil, or good soil, or sandy soil, the ones that stood the drought better were the ones that the soil had been carefully and systematically built up through organic matter. The droughts in 1930 and 1932 have given us a good demonstration of the value of organic matter.

Those particular orchardists, who for some reason or other, either because they like to cultivate or did cultivate their soils, or whether they saw a dry season coming and broke their soils and cultivated early this season, had the best looking orchards as far as drought injury was concerned. No matter what soil type, the cultivated orchard was the better within each type. The man who cultivated had the best looking orchard, except when the orchard had

been in sod for a long time and was plowed deeply late in the spring, cutting many of the roots. In such cases the trees suffered; but the man who disked and broke that sod last fall or early this spring before growth started, those were the orchards that were outstanding this year as a general thing.

Another fact that stood out was that those men who had either cultivated, or had not cultivated, but had available, at relatively cheap cost, a supply of mulch and had mulched their trees early, beginning in the late winter or early spring, had good-looking orchards. Such moisture as fell on the hillside did not drain off but got into the soil and once in, did not evaporate so quickly because of the mulch. You could see the value of the early mulching. Where mulch had been applied later in the spring, you could not see as much benefit.

There is no question about the value of irrigating the orchard this year. The man who had water and applied it, did not have all the difficulties that others had.

Regardless of soil type, the greatest injury and the quickest drought effect, was where the trees were very thick, 20′ x 20′. Part of the trees should have been pulled out six or eight years ago. With all those trees on the ground, removing the moisture that they required, the soil reached the wilting percentage sooner. Old orchards that were not crowded so badly on good soil types had a good crop; and yet, standing close to such orchards, were orchards with the trees crowded and those orchards often suffered badly.

In the limestone areas, the trees on the outcropping limestone ledges were badly injured in many cases. Many of them died; many, if not dead, stopped growing, and the leaves after wilting and hanging for a long time, dropped, and the terminals died back. Those areas just could not stand the drought.

You will find many examples like that, and under the

present competition—and we must meet stronger competition in the future—we should be very careful about selecting deep, well-drained, fertile soils wherever possible before planting orchards.

Trees whose roots had been injured by mice suffered during the past summer.

Another thing was the effect of Root Rot in this area. You know how it affects certain limbs individually and finally collectively and the tree goes out. This year, many of those trees, even though they had not begun to show injury above ground, when we dug down we often found an injury from Root Rot. Those trees were just starting to go out and with the drought they went out.

All of this indicates that we should be particular about the soils in which we plant orchards. We should study orchard soils in relation to tree growth. We should dig down into the soil at several places in the field and study these several layers of soil types before the trees are planted.

In one orchard that was studied, we found that the trees planted on one part had done fine, but those on another part were only half as large. We found a sandy loam, and here the roots had penetrated deeply and widely. In the poor section the sub-soil was an impervious hard clay and the roots could not go down, and the trees were only half as large.

SUGGESTIONS FOR CARE OF DROUGHT-INJURED TREES

Although irrigation would be valuable in dry seasons I doubt if you can all put in irrigation systems.

I would say one of the general things to do this coming spring, based upon the remarks of Dr. Magness, Dr. Cullinan and all the rest, is this. These trees which have been drought injured are in pretty bad shape and you want to give them a start in the spring. We want to do everything

we can to take away all competing factors; get all the moisture and nitrate we can, which comes down to breaking your sod orchards. I believe this coming season, in spite of favorable discussions of sod mulch, generally speaking, it would pay to crack up, or break up, those sod orchards before growth starts next spring, and the quicker you do it the better, unless your orchards are on a steep hillside. Do not have grass competing there with the trees early in the spring for either moisture or nitrate. I am not advising keeping those orchards permanently broken up under all conditions but under our particular conditions this year, I believe it is a desirable thing to do.

Another thing that I would suggest is to reduce competition by removing those trees that are too thick on the ground. You have doubtless been intending to pull them out for the past five or six years. Why not stop the expense of pruning and spraying and fertilizing them and do something to give the other trees the additional amount of nitrate and moisture?

Generally speaking, it is well to get some nitrogen on the orchards this year, depending upon the particular condition of your individual orchard and of your pocketbook. As a general suggestion, if you can do it, get on some nitrogen and get that on before growth starts next spring; try to get it on by March 1st, or any time from now on; get it on before growth starts early next spring.

There are four types of drought-weakened orchards:

1. Type of trees badly injured, either dead or so nearly died back in the tops and were on very shallow soil, that you know have never made normal growth; never been espedead; the trees were badly wilted, they lost leaf area, cially profitable. Get rid of them.

2. Type of trees, pretty badly injured; but yet not going to die by any means. You ought to handle them pretty carefully and that will cost you money. For fear of making

recommendations that cost money and having you think I am not sympathetic with your financial condition, I hate to say some things I am going to say.

First: Cultivate these orchards and the sooner the better. Then get some nitrogen on them; maybe not as much as you have been putting on in the past. If you have to borrow money, you probably could not afford to do it. Cultivate them, put on half the amount of nitrogen you would normally; and if you have some cheap mulch on the place, or can get it cheaply, mulch those trees and try to hold the moisture and loss through evaporation next year. Also give them a moderate detailed pruning.

If hard up financially and it means you must borrow the money, cultivate that orchard thoroughly, and try to put on one-fourth of the normal amount of nitrogen.

If in a better fix financially, give them some pruning.

If in good condition financially, give those trees pretty good treatment this year, unless you plan to pull that block out.

3. The next type of trees are those that are injured some, but not seriously. I would make the same suggestions as above, depending on financial condition; but certainly cultivate them and apply nitrogen.

4. Now we come to the last group of trees, not injured very much and on good, deep soil, with the roots down deep and that did not suffer very much this past season. If pretty hard up financially, do no more than cultivate them. Do not buy nitrogen or prune them, however, mulch them if possible. Do not spend any money otherwise, unless in good shape financially, in which case buy nitrogen and prune them. I think they will get along very well one year. I think it is better this coming year, and maybe next year, under the financial conditions, just to keep the orchards growing without too much expense.

No matter how you handle these orchards, if you have a

heavy set of fruit, plan to thin that fruit. That will cost money, too; but, if it should be dry, there is no need of growing small stuff you cannot sell. Better take a chance of the cost of thinning and hope to make some money on the larger sized fruit. I believe you will have to do that on the weak trees; you cannot develop a crop on trees in weakened condition.

Lastly, that brings us to the thing we have all admitted today—we have got to spray. If we do not keep the leaf area in excellent shape, so it will function properly, we cannot expect to produce good fruit.

THURSDAY MORNING

January 5, 1933

PRESIDENT CARPENTER: I call on Hon. J. J. Cornwell, General Counsel, Baltimore and Ohio Railroad, to speak to us on "The Railroad Situation."

THE RAILROAD SITUATION

JOHN J. CORNWELL,

General Counsel,

The Baltimore and Ohio Railroad Company.

The invitation to address you is ample evidence of your interest in the matter of railroads.

First, I should say, that despite the marvelous development of motor transportation, you realize that your business, like that of every other in the country, still is mainly dependent upon the railroads for, notwithstanding motor and water transportation, between 70 per cent and 80 per cent of all freight tonnage is handled by rail, which fact makes it plain that the railroads cannot be dispensed with.

Second, the railroads are your largest taxpayers and employers. They pay into the various public treasuries approximately a million dollars a day in taxes. Were they abandoned, torn up or removed from the tax lists by being transferred to the Government as their owner, public schools would, in some instances, be forced to close unless additional heavy taxes were levied on all other classes of taxable property.

Third, I think growers of apples and peaches are coming to realize that unregulated truck competition with the railroads is not an unmitigated blessing to the grower; that

to some extent and in some instances, they suffer from it as much as do the railroads.

More than a score of years ago I was a large shipper both of peaches and apples. I was the principal owner of the largest Grimes Golden apple orchard in the world, nearly five thousand trees of that single variety, and it was in this State of Maryland, Allegany County. In those days, as all shipments were by rail, we could know just how many carloads of fruit were on any particular market each day and approximately the number of cars rolling to that market. Today you are without that information for you do not know how many hundreds of truck-loads of fruit are on the highway bound for a particular market or the character or quality of fruit they are carrying. A market may be glutted with inferior grades one day and barren of your products a day or two later. You are shipping and selling in the dark, as it were, and the commission merchants in the cities are being driven out of business.

Then the Federal inspection law—the Borah-Summers Law, which standardizes your pack and subjects your products to rigid inspection—does not reach the truck-peddler who drives into an orchard, insufficiently maintained, loads up with inferior fruit, crosses State lines, untouched by the law, dumps his load onto your markets, depressing them and making it impossible for you to obtain a decent price for high quality, Federal-inspected fruit.

To simplify the task you have assigned to me, suppose we break the subject up into three parts:

1. What is the present condition of the rail carriers, physically and financially?

2. What is the cause of their present condition?

3. What, if anything, can be done about it?

Of the Class 1 railroads, only a few will earn their fixed charges this year, that is, have enough revenue to pay wages, taxes and interest on their indebtedness, forgetting all about

dividends on their capital stock of more than twelve billions of dollars, owned and held by some two million people, many of them women. Altogether the roads lacked two hundred millions of dollars of meeting their fixed charges for the year just ended. Many of them would have gone into the hands of receivers except for loans obtained.

a. From the Railroad Credit Corporation, into the treasury of which went the money derived from the small rate increase allowed by the Interstate Commerce Commission almost a year ago, and

b. From the Reconstruction Finance Corporation, the great Federal credit agency created by Congress to aid banks, insurance companies, railroads and, by a subsequent Act, States, counties and municipalities.

In consequence of this bad showing, the market value of railroad bonds has declined to the point as to make many people fear for the solvency of savings banks and insurance companies, the largest holders of the bonds for, as you know, there are sixty-five million people in this country who have insurance policies, and some forty millions separate savings accounts, and the vast savings of our people are invested in insurance and deposited in savings banks. Those institutions, in turn, to earn dividends for their policyholders in the one case, and their savings depositors in the other, must invest the money in some interest-bearing security, and until recently, railroad bonds were regarded as the best, except, of course, Government bonds.

If the railroads were permitted to go broke, collapse or even to go through receiverships and their bonds have to be scaled down 50 per cent, it is inevitable that the institutions in which most of our people are vitally interested would be heavy losers.

As to the physical condition of the railroads: Due to the high standard of efficiency and maintenance, and despite heavy curtailment in maintenance during the past two

years, they are still operating efficiently and safely. However, the time is not far off when maintenance costs necessarily will have to be increased to some extent, if the high standard of service the railroads have given the public the last decade is to be continued.

Having thus glimpsed the physical and financial condition of the railroads, we come to the second and most involved part of our subject—the cause, or causes.

Anybody can guess that the principal cause is the depression, the slump, our present industrial and economic condition. With the steel output down to 15 per cent; with the coal business off correspondingly; with building at the lowest ebb in years; with our exports at a minimum, it is not surprising that railroad traffic is off more than 50 per cent. With this heavy decline in traffic; with the railroads unable to shut down their plants and stop operations completely, as many factories have done, they have not been able to meet the impact of the depression as well and as successfully as some other lines of industry, though they have made sharp reductions in their service.

But, in addition to the slump in business, the railroads have encountered sharp competition in the shape of water, motor and air transportation, which is taking the cream of their business, leaving to them the skimmed milk, and some of it sour milk, at that.

So far as this competition is a natural development and is economically justified, the railroad managements have no right to complain, but when such competition is subsidized, fostered, or even aided and abetted by Government and would not otherwise exist, then railroad managers and owners have a right to complain.

I assert that it is a matter such organizations as yours can not afford to ignore, and ask you to be patient while I go more fully into this phase of the matter. Before discussing that phase of the situation, however, it may be interesting to review just a little the question of railroad regulation.

While railroad construction began here in Baltimore on July 4, 1828, and while just prior to the great Civil War, and shortly thereafter, railroad construction had a tremendous impetus, the transcontinental lines being built across the Rocky Mountains to the Pacific Coast, it was not until 1887 that the Interstate Commerce Act was passed and the Interstate Commerce Commission created. Up until that time the railroads were without governmental regulation. Because of the sharp competition among the rail carriers, many of which had been built into undeveloped territory and were without sufficient traffic to maintain them pending the development of the country along the lines, practices were indulged in inimical to the public interest, such as giving lower rates to large shippers than were allowed to the small shippers and the granting of rebates to large shippers. The Interstate Commerce Act was enacted and the Interstate Commerce Commission created to prevent discrimination. This was in the public interest, and this regulation continued until 1904, when the spirit of "progressivism" began to sweep the Middle West.

In that year there came together in the City of Chicago representatives of large shippers, ambitious politicians, lawyers representing shippers' organizations, and some State officials, from all over he West, Southwest and Middle West. This meeting termed itself "Interstate Commerce Law Convention." Its avowed purpose was "to devise new laws, put teeth in the old ones, regulate the railroads, fix their rates by basing them on their earnings, to compel competition," and it might be said now to make railway managers mere figureheads. The steps taken at that meeting provided the platform upon which many politicians rode into office by waging war on the railroads. Important amendments to the interstate commerce law was the result of the campaign there inaugurated and the widespread public sentiment against railroads thus created. Most of the States took up the idea and public service commissions and other regulatory bodies were created with extraordinary powers.

Two-cent fare laws were compelled in many instances, because of it, to operate passenger trains under order of public service bodies at tremendous loss. Regulation of the railroads was extended and there was written upon the statute books by Congress the "Ash Pan Act." "Bills of Lading Act," "Boiler Inspection Act," "Clayton Antitrust Act," "Elkins Act," "Hours of Service Act," "Safety Appliance Act," and innumerable other federal statutes that affect the railroads in some particular and thousands of State laws designed to regulate the railcarriers more rigidly.

I am not criticizing any of these acts. The people through their Congress and through their State Legislatures deemed it wise through these various measures to virtually take the control of the railroads out of the hands of the men whom their owners selected and held responsible for the management. I mention these things only to show you what has happened to the railroads in the way of governmental regulation and to emphasize that such regulation, while it may be entirely in the public interest, has been nevertheless exceedingly expensive, and in this era of competition puts them at a great disadvantage in dealing with their competitors.

Approximately twenty years ago when the politicians were still waging war on the railroads the public was told that they were over-capitalized; that their stocks and bonds did not represent value; that if the Interstate Commerce Commission would find the actual physical value of the railroads it would show that they were worth less than one-half of the total par value of the stocks and bonds outstanding. Upon this representation the LaFollette Valuation Act was enacted and the work of valuing the railroads began. It went on at a cost to the railroads of one hundred and fifty millions of dollars and to the Government of forty millions of dollars. The tentative report made by the Commission showed that the actual physical value of railroad properties, based on pre-war prices, was some two billions of dollars

in excess of the total par value of all the stocks and bonds outstanding.

Without going into a discussion of the rates it is sufficient to say that because their rates were controlled by the Interstate Commerce Commission and the various public service commissions in the different States, had the railroads sought to do so, they were not in a position to advance their charges during the period of inflated prices when the costs of all commodities were rising, and therefore the average railroad did not reap the benefit of the period of prosperity which this country enjoyed prior to the fall of 1929 and were without large cash reserves such as many private industries were able to set aside during that period. The consequence of this was that when the depression came they did not have such cash reserves to draw upon as had many industries and industrial corporations and were obliged to meet the situation by reducing operating costs in every possible way. This has resulted in the furloughing of approximately one-half million of their employees, which has inflicted a tremendous hardship upon the men and greatly reduced the country's purchasing power.

All these regulatory measures to which I have referred were enacted at a time and upon the theory that the railroads had a monopoly in transportation, but that situation has changed in a comparatively short time.

What has happened in the past dozen years? In that time, or at least within a score of years, the American people have invested in motor vehicles twenty billions of dollars, and in garages and gasoline stations ten billions more, or two and a half billions of dollars more than have been invested in railroads in more than one hundred years. In addition to that the several States have put the enormous sum of fifteen billions of dollars into the construction of State highways and eight billions of dollars into boulevards and streets inside of municipalities for the accommodation of motor vehicles, in which thirty billions of dollars have

been invested directly and indirectly. Upon these highways and streets are great fleets of common carrier and contract and private trucks competing at every turn with the railroads. The bonds issued by the States for the construction of the highways are tax free, and the highways pay no taxes. The bonds issued by the railroad companies for the construction of railroads are taxable in the hands of the holder, and the railroads themselves pay taxes upon their properties at the rate of fifteen hundred dollars per mile per annum. The public, through the State, has provided a right of way for the operation of this new agency competing with the railroads, and insofar as the Federal Government is concerned these agencies are without any regulation whatever, and many of the States have as yet done little in the way of regulating them. The common carrier truck or the contract truck can fix any rate or make any charge its owner sees proper to name. It can select any commodity it cares to haul and refuse to haul anything which it deems unprofitable. The railroads must haul any and every commodity offered, and they are without authority to make arbitrary reductions in rates to meet the unregulated and subsidized competition.

But while this competition with the railroads was suddenly developed and being fostered with the taxpayers' money, our Federal Government has been appropriating hundreds of millions of dollars for the development of inland waterways. Rivers not navigable naturally have been made navigable by huge governmental expenditures, ostensibly in the public interest, but, as a matter of fact, the benefits have been derived by comparatively few industries.

The Government has gone even farther: It created and has maintained the Inland Waterways Corporation, operating a fleet of barges on the Mississippi River and its tributaries. Into this project it has put twenty-four millions of dollars. The War Department operates it, and while it was supposed to demonstrate that such operations were profitable, and it was intended that when such demonstration had

been made, it would be sold to a private company, the Government still has it on its hands, and in 1931 appropriated an additional three millions of dollars to strengthen the proposition. General Ashburton, who heads this particular Government activity, is diligently trying to show that it has at last become self-sustaining, but in looking over his accounts, about the only profit I can find is an item of seventy-six thousand dollars interest collected from banks where he deposited some of the three million dollars to which I have just referred. Because of this competition and the demoralization of the railroad rate structures resulting from it, railroads over the entire country have suffered severely, and some of those with which it directly competes have been ruined.

Briefly and hurriedly, this is the railroad situation, and these are some of the causes which have brought the railroads to their present plight. Now what can be done about it?

The railroad managements say that, in the interest of the public, in the interest of fairness, as well as in the interest of those who own railroad securities, railroad competitors, truck lines, bus lines and waterways, should be regulated exactly as the railroads are regulated, no more and no less. Is there any good reason why such a policy should not be inaugurated?

The railroad managements further say that the act, creating the Reconstruction Finance Corporation, which empowers it to make loans to the railroads to tide them over this emergency, should be liberalized both as to the rate of interest charged to the railroads and the kind of security required for their loans. The act requires that the security should be "ample." This restriction makes it necessary for the Finance Corporation to exact of the railroads the same kind of collateral as a hard-boiled banker would require for a similar loan. In many instances, this kind of collateral has been exhausted, and if the Finance Corporation is to

continue to furnish aid to the railroads, unobtainable at private banks, until this emergency is passed, it should have more latitude and be able to exercise a more liberal policy in making loans.

You may ask why should the Reconstruction Finance Corporation make loans to railroads to tide them over this period. I would answer that the Government, having virtually taken over the management of the railroads, having assumed to regulate the issuance of their securities and to fix their rates so as to prevent their having large earnings during periods of prosperity, is under a high moral obligation to stand by them during this period.

Thus the Reconstruction Finance Corporation, by protecting the railroads against bankruptcy, protects the savings banks and insurance companies, the largest owners of railroad securities, which it was primarily created to support.

It is not a new thing for the Government to lend money to the railroads. After the World War, in which the Government used the railroads as a war agency, when they were handed back to their owners, more or less dilapidated, with their organizations and business demoralized, a revolving fund was appropriated by Congress to be loaned to the railroads until they could get on their feet. During the deflation period which followed, loans were made by the United States Treasury, on authority of the Interstate Commerce Commission, of more than nine hundred millions of dollars, and thus the railroad transportation system in the country was saved from demoralization. Of that huge sum of money all has been repaid, except a few millions of dollars, and if the Government is never able to collect the amount still due, because it charges 6 per cent interest on money which it obtained from the people at from 3 per cent to 4 per cent, it already has a profit of some fifty millions of dollars.

The same outcome reasonably can be expected in this

situation, unless it be that we are facing complete governmental and individual insolvency, in which event nothing matters. For one, I do not believe that any such condition confronts us. On the other hand, the resources of our country, the genius, the courage and the intelligence of our American citizenship appear to me to insure an ultimate return to normal conditions and the continued progress of our country and the advancement of our civilization.

Finally, it appears to me that we are at a crucial point, at the parting of the ways, insofar as our governmental policy is concerned, in its course toward the railroads; that, the road which we are to take and to follow will determine not only the fate of the American Railroad System but will have a profound effect upon all private industry and enterprise, perhaps upon the Government itself and upon our future civilization.

There are two courses open:

One, advocated by certain political groups, in and out of Congress, and by certain newspapers, is immediate, lavish expenditures by the Federal Government for "public improvements," that is, to construct Government buildings in every town and village; deepen waterways; make navigable every creek and river and construct miles and miles of additional highways—all to relieve unemployment and rout the depression. Of course, the proposed billion-dollar St. Lawrence Waterway development is one of the hundreds of projects with which these people would make the country "prosperous."

Where will the money come from? Would they issue bonds, upon which interest must be paid, putting the money into non-income producing projects that would have to be maintained at terrific cost to the taxpayers, for public buildings must be heated, lighted and janitored, and deepened rivers must be dredged often and the locks maintained, but neither class of "public improvements" earn any interest

on the investment or repay to the Government any part of the money put into them.

Already there are outstanding in this country approximately fifty billions of tax-free, Government bonds, Federal, State, county, district and municipal, upon which the people are taxed to pay interest. When one-fifth of the total wealth of the country—present prices—is represented by tax-free securities, the other four-fifths naturally have to carry the entire tax load and that load is now so heavy that individuals and corporations alike are staggering under it.

The other course is for the Government, wherever necessary during this crisis, to use its strong credit arm to continue to sustain financial institutions, life insurance companies, and the railroads, the vital transportation agency of the public, economizing in public expenditures in the meantime so as to make the tax burden as light as possible.

This country grew and prospered because of private industry, and not as a result of public expenditures. It is private industry that pays taxes to support government. The more capital buried in public works, the less there is to tax; the less there is to earn incomes to be taxed. Through private industry come wages as well as taxes. In the other policy is the open door to Socialism and Communism.

Which road are we going to travel?

PRESIDENT CARPENTER: I want to take this opportunity to thank Mr. Cornwell for appearing before our Society.

Next on our program is an address by Mr. Hugh Leach, Managing Director, Baltimore Branch, Federal Reserve Bank, Baltimore, Maryland, "The Rediscount of Agricultural Paper by Federal Reserve Banks."

Mr. Leach was formerly associated with the Reconstruction Finance Corporation.

THE REDISCOUNT OF AGRICULTURAL PAPER BY FEDERAL RESERVE BANKS

HUGH LEACH,

Managing Director of the Baltimore Branch of the Federal Reserve Bank of Richmond, Baltimore, Maryland.

The Federal Reserve System is little understood by business men and farmers because they do not often come in direct contact with Federal Reserve Banks. Consequently, I shall attempt to outline very briefly the organization and principal functions of the Federal Reserve System before discussing more particularly the rediscount of agricultural paper.

ELEMENTS OF THE FEDERAL RESERVE SYSTEM

The Federal Reserve System consists of the Federal Reserve Board, the Federal Advisory Council, and the Federal Reserve Banks. The Federal Reserve Board is the governing body of the Federal Reserve System. It consists of eight members, of whom two—the Secretary of the Treasury and the Comptroller of the Currency—are members ex-officio, and six are appointed by the President of the United States by and with the advice and consent of the Senate. The Federal Reserve Board exercises general supervision over the Federal Reserve Banks. Through general oversight and inspection, it has the duty of seeing that the Federal Reserve Banks operate in accordance with the provisions of law. The Federal Advisory Council is composed of twelve members, one from each Federal Reserve District, chosen annually by the boards of directors of the respective Federal Reserve Banks. The purpose of the Council is to give the Federal Reserve Board the benefit of the advice of men outside the active operations of the System. Federal Reserve Banks and Branches are not Government

institutions and their employees are not Government employees. All of the stock in the Federal Reserve Banks is owned by member banks and the majority of the board of directors of each Federal Reserve Bank are elected by member banks. There are twelve Federal Reserve Banks. The twelve banks have twenty-five branches. In the Fifth Federal Reserve District, which comprises the District of Columbia, the States of Maryland, Virginia, North Carolina, South Carolina and West Virginia (except six counties in the extreme northwestern part of the State), the parent bank is located at Richmond and the two branches are situated in Baltimore and Charlotte. Each Federal Reserve Bank is managed by a board of nine directors, of whom six are elected by member banks and three are appointed by the Federal Reserve Board. Three of the six directors elected by member banks are bankers and are intended to be representatives of the stockholding banks, and three are men who, at the time of their election, must be actively engaged in commerce, agriculture or some other industrial pursuit.

MEMBERSHIP IN THE FEDERAL RESERVE SYSTEM

All national banks are required to be members and eligible State banks and trust companies may become members with the approval of the Federal Reserve Board. Each member bank must subscribe to an amount of the capital stock of the Federal Reserve Bank equal to 6 per cent of its paid-up capital and surplus. Up to this time the Federal Reserve Board has not called for the second half of the stock subscription of member banks, consequently each member bank holds stock of a paid-in value equal to 3 per cent of its paid-in capital and surplus. Member banks receive an annual dividend of 6 per cent on the paid-in value of their stock, which dividend is cumulative. Federal Reserve Banks are allowed to retain all surplus earnings after the payment of the current dividend until a surplus fund equal to 200 per cent of the paid-in capital is accumulated. If after the establishment of such a surplus, any profit remains, 10 per cent

of such remainder is retained by the Federal Reserve Bank as a further addition to surplus and 90 per cent is paid to the Government as a franchise tax.

FUNCTIONS OF FEDERAL RESERVE BANKS

The principal function of Federal Reserve Banks are:

1. To effect the concentration and mobilization of reserves.

2. To provide an elastic currency by the issue of Federal Reserve notes.

3. To afford means of rediscounting industrial, commercial and agricultural paper.

MOBILIZATION OF RESERVES

Prior to the establishment of the Federal Reserve System, our gold reserves were scattered in the vaults of 27,000 banks. The gold was here but it could not be used effectively when it was needed most as the basis for credit and currency.

The Federal Reserve Act requires each member bank to carry a reserve with the Federal Reserve Bank of its district equal to certain percentages of its demand and time deposits. Each Federal Reserve Bank is, therefore, a reserve center for its district, and the reserves of all 12 Federal Reserve Banks are effectively centralized through the provision of the Federal Reserve Act that the Federal Reserve Board may permit or require Federal Reserve Banks to rediscount for each other. At one time, the Federal Reserve Bank of Richmond was borrowing from other Federal Reserve Banks $55,000,000, a sum greater than all the available reserve deposits of its member banks at the time. At other times, the Federal Reserve Bank of Richmond made loans to other Federal Reserve Banks.

Another great defect of the old banking system was the bond-secured currency. All national bank notes were based on Government bonds, which bonds had their origin in the War Between the States. The bonds had been issued in great volume and were adequate in amount to form the basis of a currency system in the years directly following that great struggle, but they shrank in volume and became concentrated in holdings as the years went on. So we had a growing country with expanding needs and a currency system on a shrinkage basis.

Under the Federal Reserve System national bank notes have to a large extent been replaced by Federal Reserve notes. These notes are direct obligations of the United States; however, the holders have a first lien upon the assets of the Federal Reserve Bank by which they are issued. Federal Reserve notes are in the following denominations: $5, $10, $20, $50, $100, $500, $1,000, $5,000 and $10,000. The process of issuing Federal Reserve notes may be briefly described as follows: unissued notes are provided by the Treasury Department at the bank's expense, and are lodged with the Federal Reserve agent, who keeps them in special compartments in the vault of the Federal Reserve Bank in joint custody with an officer of the bank. Upon requisition of the bank, notes are turned over to the bank by the Federal Reserve agent, who must, however, take collateral for the notes, which collateral he must continue to hold as long as the notes remain outstanding. The collateral may consist of gold or rediscounted or purchased paper. (The Glass-Steagall bill passed last February authorized the Federal Reserve Board until March 3, 1933, to permit the use of Government securities as collateral against Federal Reserve notes.) Federal Reserve Banks, however, must maintain a reserve equal to 40 per cent of the amount of their Federal Reserve notes in circulation, which reserve may be used as collateral.

Since the public does not carry any more Federal Reserve notes or other forms of currency than it requires to transact

current business, and since member banks do not hold any more idle cash in vault than is necessary to meet the demands of their customers, all Federal Reserve notes not needed by the public and the banks promptly find their way back to the Federal Reserve Banks and may be retired from circulation. On the other hand, at each Federal Reserve Bank the Federal Reserve agent has at all times an ample supply of unissued Federal Reserve notes in various denominations, which can instantly be procured by a Federal Reserve Bank in exchange for collateral and put into circulation in response to a demand for currency. We have, therefore, a perfectly elastic currency, which will automatically expand and contract as conditions require. This means that there will be no more panics resulting from a shortage in currency, as was formerly the case when national bank notes could be issued only against Government bonds, the supply of which was limited.

REDISCOUNTING FOR MEMBER BANKS.

The lending power of a Federal Reserve Bank is determined by two elements: (1) by the amount of its paid-in capital and surplus and deposits; (2) by its power to issue and keep outstanding Federal Reserve notes.

A Federal Reserve Bank is, of course, not required to hold any reserve against its capital or surplus; it is, however, required to maintain a reserve of 35 per cent against the reserve deposits of its member banks and against Government deposits. Therefore, a Federal Reserve Bank can lend back to its member banks the total amount of its paid-in capital and earned surplus plus 65 per cent of its member banks' reserves and other deposits. This would amount to a sum sufficient to accommodate a considerable number of banks, and is a great improvement over the old national banking system, because the pooling of reserve deposits in a Federal Reserve Bank makes it possible to take advantage of the fact that the season for expansion is one part of the district frequently coincides with the season for contraction

in another. The power of one Federal Reserve Bank to rediscount with or for another Federal Reserve Bank enables the system as a whole to take advantage of the varying time of seasons in different parts of the country. The lending power of a Federal Reserve Bank, however, does not end here. It is further increased by the right to issue Federal Reserve notes, which is given to Federal Reserve Banks by the Federal Reserve Act. If the loans of a Federal Reserve Bank to its member banks were paid in gold or lawful money, the limit of its lending power would be reached when it had discounted an amount of paper equal to its capital, earned surplus and 65 per cent of its deposits. If, however, it could pay for the loans to member banks in Federal Reserve notes, the fact that a reserve in gold of only 40 per cent is required against Federal Reserve notes would increase its lending power to two and one-half times the amount it could lend if payment were made in gold or lawful money.

Federal Reserve Banks are allowed by law to rediscount for member banks, paper arising out of actual commercial transactions or seasonal agricultural requirements; that is, paper drawn for agricultural, industrial or commercial purposes, or the proceeds of which have been or would be used in producing, purchasing, carrying or marketing goods in one or more of the steps of the process of production, manufacture or distribution.

AGRICULTURAL PAPER.

Agricultural paper was given by law an important advantage over commercial paper since the latter can be rediscounted only for a period not exceeding ninety days, while paper which is issued or drawn for an agricultural purpose, or is based on live stock, may be rediscounted by Federal Reserve Banks even though it has nine months to run from the date of rediscount.

For the purpose of this discussion, agricultural paper

may be defined as a negotiable note, draft or bill of exchange issued or drawn, or the proceeds of which have been or are to be used, for agricultural purposes, including the production of agricultural products by the growers thereof, or the carrying of agricultural products by the growers thereof pending orderly marketing, and the breeding, raising, fattening or marketing of live stock.

In the ordinary course of events, the farmer begins to prepare his ground for crops in the late fall or early spring. At the proper time he pays for his labor in money or supplies. He must purchase fertilizer and seed, take proper care of the growing crop and, when it is ready to be harvested, must again supply the labor and pay the necessary expenses to put it in condition to be marketed and to transport it to market. From time to time the farmer may find it necessary to go to his bank and borrow money for the purposes enumerated. Such notes are eligible for rediscount by Federal Reserve Banks when offered by member banks.

The Federal Reserve Board has held:

> That the marketing of crops or live stock includes carrying them for a reasonable time in order to market them in an orderly manner, instead of dumping large quantities on the market at any one time in order to get money with which to meet current expenses;
>
> That a note issued by a farmer and discounted by him at a bank, the proceeds of which are used for the purchase of cows which will be retained for a considerable length of time to produce milk, butter, cheese, etc., is eligible for rediscount;
>
> That notes given by farmers in payment for agricultural implements to be used on the farm are eligible for rediscount as agricultural paper.

While notes given for current agricultural purposes are eligible for rediscount, some farmers' notes cannot be rediscounted by Federal Reserve Banks. Among the latter are notes given for the purpose of buying additional land, building barns or silos, or adding to permanent equipment. Notes, the proceeds of which were used to purchase stocks or bonds other than government bonds, or to speculate in commodities, are likewise ineligible for rediscount.

The Discount Committee of the Federal Reserve Bank to which a discount offering is made by a member bank must pass upon the acceptability of the paper from a credit standpoint, as well as upon its eligibility under the law and the regulations of the Federal Reserve Board. In other words, the paper must be good and collectible as well as eligible. In order to be in a position to pass intelligently upon the eligibility and acceptability of the paper offered, the Baltimore Branch of the Federal Reserve Bank of Richmond secures certain information from the offering banks, including financial statements of the makers of the notes, unless the amounts involved are small. Such information includes the number of acres under cultivation, the number of bearing trees, the value of last year's crops, the estimated value of crops for the current year, etc. It is also required that an authorized officer of the member bank sign a certificate with respect to each offering to the effect that, to the best of his knowledge and belief, the paper submitted was issued for an eligible purpose.

The fact that farmers' paper issued for the purpose of acquiring additional land, buildings or silos is not eligible for rediscount by Federal Reserve Banks does not necessarily mean that such paper is not good from a credit standpoint. It simply means that the paper is not self-liquidating in the sense that it would be paid out of the proceeds of the current year's crops and is not the type of collateral that should be security for outstanding Federal Reserve notes.

Federal Reserve Banks rediscount only short-time paper, because the banking experience of the world points conclusively to the wisdom of central banks maintaining a highly liquid condition. The rediscounting of short-time, self-liquidating paper guarantees that a Federal Reserve Bank will never be caught in such a position that it cannot supply currency and credit to any reasonable extent instantly and on demand.

PRESIDENT CARPENTER: I wish to appoint the Legislative Committee—Mr. J. Andrew Cohill, Mr. W. Lee Allen, Mr. C. E. Bryan, and Mr. W. Earle Withgott.

Adjournment.

REPORT

OF THE

Twenty-sixth Annual Meeting

OF THE

Maryland Crop Improvement Association

Wednesday and Thursday,

January 4 and 5, 1933

BALTIMORE, MARYLAND

The twenty-sixth annual meeting of the Maryland Crop Improvement Association, together with the Annual State Corn Show, was held in the Lord Baltimore Hotel, Baltimore, on January 4 and 5, 1933. A joint program was presented the second day in co-operation with the Home and Community Department of the Maryland Farm Bureau Federation.

Following is the program presented at the two-day meeting:

PROGRAM

MARYLAND CROP IMPROVEMENT ASSOCIATION

WEDNESDAY

January 4, 1933, 10 A. M.

1. Call to Order by Noah Arbaugh, Westminster, Md., President Maryland Crop Improvement Association.

2. Relationship Between Ear and Grain Characteristics of Corn, and Yield. Dr. Russel Rothgeb, Department of Agronomy, University of Maryland.
   Discussion.

3. Lespedeza. Henry Miller, Department of Economics and Farm Management, United States Department of Agriculture.
   Discussion.

4. The Corn Borer Appears in Maryland. Dr. E. N. Cory, State Entomologist, University of Maryland. Motion Pictures of Corn Borer Work.

5. Committee Appointments.

PROGRAM

THURSDAY

January 5, 1933, 10 A. M.

1. Call to Order by the President.

2. Markets for Maryland Wheat. Dr. Samuel DeVault, Department of Agricultural Economics, University of Maryland.
   Discussion.

3. Distribution of Different Varieties of Wheat in Maryland. Dr. W. B. Kemp, Department of Agronomy, University of Maryland.

4. Uses of Maryland Wheat. Mr. Geary Eppley, Department of Agronomy, University of Maryland.

5. Committee Reports.

PROGRAM

THURSDAY

January 5, 1933, 1.30 P. M.

JOINT PROGRAM OF THE MARYLAND CROP IMPROVEMENT ASSOCIATION AND THE HOME AND COMMUNITY DEPARTMENT OF THE MARYLAND FARM BUREAU FEDERATION.

1. Call to Order by J. E. Metzger, Head of Department of Agronomy, University of Maryland.
2. Maryland Wheat Flours. Dr. H. J. Patterson, Dean of College of Agriculture and Director of Experiment Station, University of Maryland.
   Discussion.
3. Results of Experiments with Maryland Wheat Flours. Mrs. M. F. Welsh, Home Economics Department, University of Maryland.
   Discussion.

RELATIONSHIP BETWEEN EAR AND GRAIN CHARACTERISTICS OF CORN, AND YIELD

By DR. RUSSEL ROTHGEB

My subject is old and has the habit of making an almost perennial appearance in connection with corn shows. Doubtless ear characters, associated as they are with the fruit of the harvest, have been important ever since man began cultivating corn. Beginning with the time when Indian squaws with clumsy hoes planted their gaudily colored maize in hills fertilized with fish, and extending into the present time with its machine cropping, its commercial fertilizers, and its score cards, the "looks" of the ear have played a big part in seed selection.

EAR CHARACTERS

By analyzing that vague and composite term, "looks," into component parts we are able to obtain a long list of details more or less definite in describing a husked ear of corn. These descriptive details have long been referred to as ear characteristics, or if they are capable of showing a range of expression we may call them ear characters in accordance with the custom of plant and animal breeders. Length of ear, circumference of ear, kernel dimensions, together with weight of kernels and cob are characters which convey an idea of size. Shelling percentage, number of kernel rows, placement of kernels, filling of butts and tips, and shape picture the arrangement and proportion of ear parts. Color of kernel and cob, density of kernel and cob, kind of starch, indentation and plumpness of kernel are general quality characters which are not only important because they help to characterize varieties, but also because their expression is so readily influenced by immaturity or disease.

INHERITANCE OF EAR CHARACTERS

The fact that varieties differ in expression for many ear characters indicates that such characters are hereditary. Experiment has shown this to be the case. However, as measured by the amount of likeness between parent and progeny or among healthy ears of a closely selected variety, ear characters differ greatly as to the degree of inheritance they exhibit. Cob and kernel colors, for example, are fairly constant and therefore are very useful in describing varieties. Since their mode of inheritance is known it is possible to predict their behavior in crosses between unlike parents. For instance, if a yellow variety is crossed with a white variety by allowing the pollen of the one to fertilize the silks of the other, the next generation of plants will bear ears having both yellow and white kernels. If the pure white kernels are picked out and planted to themselves they will breed true for color. All the daughter ears will be

white. Selecting a pure yellow strain from the cross will be more difficult because some of the yellow-appearing kernels will hide white blood. However, by planting only the yellowest kernels for a few generations a yellow strain can be established.

The inheritance of the sweet corn type of kernel is simple and definite like that of color. Unfortunately for the corn breeder most ear characters, especially those having to do with size and arrangement of ear parts, are not inherited in a simple manner. They are not constant, but show much variation even among ears of a well-bred variety. In such cases it is necessary to think of a variety being characterized by a range of variation for a particular character rather than by a single definite expression. Furthermore, growth conditions play a large part in the case of size, weight and filling of butts and tips. It would seem that here heredity merely sets an upper limit below which the character is free to respond to environment.

VALUE OF SELECTION

Very generally speaking, the improvement that can be had by continous selection for a given type depends largely upon how much selection has already been done on the material at hand. If a variety has been selected for large ears for many years, there is little hope of increasing ear size by continued attention to large ears. In many of our varieties, however, the originator has focused his attention on certain characters and neglected others. The latter still may be subject to improvement.

An illustration of the effectiveness of continued selection is furnished by an experiment conducted by Garrison and Richey of the United States Department of Agriculture. Starting out with a variety which had a range of 10 to 24 and an average of 16.1 kernel rows per ear, selection was made in both directions away from the average. In one line ears with 20 or more kernel rows were picked out of

the preceding crop and planted each year for eight generations. At the end this line had a range of 12 to 28 and an average of 19.6 kernel rows. In the other line the selection was for 12-rowed ears. At the end of the experiment this line had a range of 8 to 18 with an average of 13.1 rows per ear. Selection easily changed the average number of kernel rows, but in no case produced a strain with a constant number of kernel rows. As the work went on selection decreased in effectiveness. A point was reached where the average row number responded very little to selection. The possibilities presented by the variation in the original material had been practically exhausted.

The fact that artificial selection has been effective is attested by the numerous distinct varieties of corn now in existence. Many varieties have been established by the patient labors of such men as James L. Reid, J. S. Leaming, James Riley and many others. It is said that Reid Yellow Dent originated from a natural cross arising when a field of light reddish corn known as Gordon Hopkins corn was replanted with a small yellow strain. The cross occurred in 1847 in a field owned by Robert Reid, father of James. Beginning effective selection about 1870, the son was rewarded twenty-three years later, in 1893, by winning a prize at the World's Fair. As a result the variety became widely distributed. Since then various breeders have modified the variety into many strains, by the process of continually selecting for a desired type.

EAR CHARACTERS AND YIELD

The advent of agricultural shows and fairs encouraged many farmers in their efforts to grow good crops. Such efforts involved not only seed selection, but also field management, and ability to pick show samples. Confusion of ideals was troublesome. As time went on a given type tended to become more or less common for a community or larger area. In 1891 Orange Judd prepared a score card for corn which was later modified and adopted by the Illi-

nois Corn Growers' Association. Following this move score cards came into general use as a means of facilitating judging at corn shows. They still serve that purpose in that they promote unity of ideal among judges and exhibitors. Early corn standards were adopted according to judgments and beliefs current at the time. There was no exact evidence at hand which the relative importance of the various characteristics could be established. Later the corn show points emphasized were taken up and tested by the State experiment stations and the United States Department of Agriculture.

Experience on the farm as well as experimental results are conclusive in showing the folly of planting unsound seed. For that reason ear characteristics evidencing any trace of disease or lack of vitality are of the utmost importance. Looseness of grain, shriveled kernels, moldy kernels or cobs, and certain discolorations demand close attention and should be sufficient to eliminate ears from show samples and seed stocks. About such characteristics there is little argument.

The connection between size and shape characters and yield of the following crop is not so obvious. Reasoning along the line that "like begets like" it might be concluded that high yield of grain per seed ear means high yield per acre from the resulting crop. Early score cards were constructed on this basis. Characteristics expressive of big ears with a high shelling percentage have been favored. The cylindrical or nearly cylindrical ear with deep uniform kernels and well filled butts and tips gives a high proportion of grain to cob. Without doubt such an ear approaches our conception of the perfect ear. Most of us admire symmetry and uniformity. Nature often falls a little short of our ideals. Aside, from aesthetic considerations, however, the shapely ear has in its favor uniformity of kernel size, which may be a factor in getting uniform dropping with a planter. The question of most importance is whether such an ear will yield more grain per acre when planted

than will sound ears of the same variety, but possessed of less desirable proportions. A mass of evidence collected since 1900 settles down to the answer, "On the average, no."

High scoring show samples have given about the same yield results as ordinary sound ears from the same seed stock. Such characters as weight of ear, length and circumference of ear, number of kernel rows, shelling percentage, etc., have shown only a negligible association with yield. What little relationship found to exist favors the long, heavy ear with relatively few rows of smooth hard kernels. Why this should be true is not clear. It may be a question of better drying, more freedom from disease, or more efficient plant food storage in the shallow kerneled, sparsely packed type of ear.

Experience has shown that under conditions not permitting the best development of the corn plant, the smaller, more shallow grained types are to be preferred. From the utility standpoint it is wise to fit the type to land fertility and season. Strong land and a long growing season with good drying weather in the fall favor the big, deep grained show type. Parts of Indiana, for example, seem to meet these requirements to a high degree. Many areas in the corn belt, however, favor the production of a type somewhat smooth and shallow kerneled. It has often been noticed that when a well selected deep grained strain is introduced and grown on thin land year after year without selection the proportion of small, shallow kerneled ears increases. It has sometimes been said that the strain has "run out." In all probability the change merely represents a natural adjustment or adaptation to the conditions at hand. Selection in such an instance may be effective in increasing the proportion of deep kerneled ears, but is likely to be attended by reduced yield per acre.

Although it is often possible to change the appearance of a variety of corn by picking out and planting the desired type each year, this process often results in reduced yields. Especially is this true if inbreeding occurs, or if an attempt

is being made to pick out a type not naturally adapted. The breeder will have to decide whether maintenance of the quality sought will compensate for possible loss in yield as measured by the weight of marketable crop.

As a usual thing strains which have been grown in the community for a long time have become adapted and will give better yields year in and year out than strains brought from a distance. Especially is this true if the locality where the seed is being produced differs greatly in climate and soil from that of the locality where the crop is to be grown. From the utility standpoint, a farmer had better buy seed from a neighbor who takes pains to produce sound seed from native stock than order from an unknown source. New varieties should be tried cautiously and on a small acreage. Experiment stations and corn breeders should be left to perform complex programs of corn improvement.

CONCLUSION

In conclusion let it be emphasized that soundness and adaptation are exceedingly important seed corn considerations. From the standpoint of seed selection for general purpose production, the purely physical characters of shape, size and proportion of ear parts are of secondary importance. Intensive selection for an ideal type from year to year may reduce the yield of grain per acre. However, it may be worthwhile to sacrifice yield to some extent in order to obtain a desirable ear type, especially if by so doing handling of the crop is made easier. Certain ear characters, not necessarily associated with yield, may be useful as variety marks or as fine points for placing close samples at corn shows.

LESPEDEZA

Mr. Henry Miller of the United States Department of Agriculture gave a discussion on lespedeza.

THE EUROPEAN CORN BORER IN MARYLAND

By DR. ERNEST N. CORY.

The European corn borer reached the borders of Maryland in the western part of the State several years ago, and it was generally thought that when favorable conditions arrived for the multiplication and migration of the pest that Garrett County would be the first portion of the State to be invaded by this unwelcomed visitor. However, to date the pest has not crossed the border from Somerset County, Pennsylvania, but in the meanwhile the infestation around Newark and in northern New Jersey has been extending its area. In the summer of 1930 there was considerable shipment of beans in the pod late in the season down the Atlantic seaboard, and during the late summer of 1931 the European corn borer was found in Accomac County in Virginia. It is believed that this infestation came to Virginia through the medium of the shipment of beans in the pod. While no infestation was found in Maryland during 1931, it is quite possible that the infestation discovered late in the summer of 1932 had its inception in the same way and at approximately the same time. The pest was discovered during late August and September on five farms in Worcester County and on one farm in Wicomico County. In the former county the pest was found in two fields at Girdletree, two near Snow Hill, and one at Newark; and in Wicomico County at Willards.

It is quite apparent, from the size of the borers collected, that the insect is of the two brooded strain, which is the strain that has done so much damage to sweet corn, lima beans, dahlias and gladiolus in the New England area. Potentially a two brooded strain has greater possibilities for damage than the single brooded strain that occurs in southern Pennsylvania. Therefore, the presence of this

two brooded strain should be viewed with some apprehension, although there is no way of determining what the actual damage may be on the Eastern Shore farms.

The moth, the parent of the injurious worm stage, is a light fawn-colored moth with a wing expanse of approximately one inch. The eggs are laid on the blades in small masses, the individual eggs overlapping like shingles. A single female moth may lay a tremendous number of eggs, but the average is about 400. The young larvae feed on the blades, making small pin holes in them, and later enter the stalk, usually, in the early generation, in the tassel which breaks over and gives a fairly reliable indication of the presence of the pest. The worms also feed in the main stalks and in the ears. In the latter case burrowing clear through to the center of the cob, which enables one to distinguish between infestation of this pest and the native corn earworm. The worm, after completing its growth, goes into a resting stage, pupal stage, from which later emerges the moth that lays the egg for the second generation. The worms live over winter in the stalk and pupate in early spring on any trash or pieces of corn stalk that remain in the field.

Fortunately, certain farm practices tend to prevent undue multiplication of the pest, with a reduction in the injury that would be otherwise expected. If corn can be cut low and placed in a silo, the fermentation there will kill all of the worms. Shredding fodder that is cut low, early in September, will destroy practically all of the worms. Plowing before April 1, and preferably in the fall, in such a way that all parts of the plant, weeds and refuse are completely turned under will be effective in controlling the pest if no subsequent cultivation drags the trash to the surface. A wide bottom plow, equipped with a weed hook or chain, can be expected to cover all trash thoroughly. Adapting any of these methods, or a combination of the methods, into the usual farm practice will help to hold this very dangerous insect pest in check. The main point to be remembered is that an absolutely thorough clean-up of all

corn fields that take place prior to April 1, if the control measures are to be effective. April 1 is set as the dead line because it is felt that by that time on the Eastern Shore of Maryland the larvae will begin their pupation. If no trash is left on the ground the larvae will be unable to pupate, but if particles of the previous crop, weeds or trash, are left on the surface the worms that crawl out of their winter quarters, the stalks that have been plowed down, ample opportunity will be afforded for these worms to find a secure place in which to pupate.

MARKETS FOR MARYLAND WHEAT

By DR. S. H. DEVAULT.

Wheat has been grown in Maryland since the colony was first settled. As early as 1839 Maryland produced over three and one-third millions of bushels. Production has increased steadily since that time, and averaged during the decade of 1920-1930 about 10,000,000 bushels annually. The reason why Maryland, far removed from the extensive margin of cultivation, has remained a relatively important wheat producing State over all these years may not be readily apparent to the persons who are not acquainted with the facts about the agriculture of the State.

Soft red winter wheat is produced on about half of the farms in the State. This class of wheat is grown where a diversified system of farming is practiced and intensive methods of production followed. It fits well into the farm rotation and is generally used as a nurse crop for hays and pastures. Many farmers maintain wheat in the crop rotation in order to provide straw for use on the farm, and to protect the land from erosion. These are important considerations in the dairy sections. As a cash crop, wheat is one farm product that can be turned into cash as soon as harvested. This is a real appeal to many growers, particularly tenant farmers who usually need the funds to settle the rent, fertilizer and other bills. For these reasons, and many others, farmers in Maryland will be slow in

substituting other crops for wheat. It is not an easy matter to find other crops which will pay better than wheat on the best wheat land in the State when all of the factors are considered. Since the specific uses of Maryland wheat and the principal reasons why it should be grown in Maryland are to be discussed in a later report before your Association, I shall not dwell longer on this point.

IMPORTANCE OF WHEAT IN THE STATE

Wheat, with an average annual value of $13,000,000 from 1925 to 1929, ranked fourth among the agricultural enterprises in Maryland, being exceeded only by corn, dairy products and poultry products.

TABLE I.
INTENSITY OF WHEAT PRODUCTION

State	Average Production 1924-1926* (000 omitted)	Land Area in Square Miles, 1925†	Average Production Per Square Mile (Bu.)	Square Miles of Crop Land and Plowable Pasture, 1924‡	Average Production Per Sq. Mi. of Crop Land and Plowable Pasture (Bu.)
Kansas	129,145	81,774	1,579	49,522	2,608
North Dakota	107,636	70,183	1,534	39,024	2,758
Ohio	32,711	40,740	803	24,519	1,334
Oklahoma	53,293	69,414	768	30,807	1,730
Illinois	38,634	56,043	689	39,567	976
Nebraska	44,251	76,808	576	39,186	1,129
Washington	35,844	66,836	536	10,200	3,514
South Dakota	26,201	76,868	341	35,296	742
Missouri	21,792	68,727	317	34,589	630
Montana	43,855	146,131	300	19,648	2,228
MARYLAND	10,181	9,941	1,024	4,302	2,367
Counties:					
Talbot	699	268	2,608	168	4,161
Queen Annes	930	365	2,548	239	3,891
Carroll	1,091	447	2,441	289	3,775
Kent	674	282	2,390	188	3,585
Washington	1,024	459	2,231	269	3,807
Frederick	1,611	762	2,114	405	3,978
Montgomery	921	521	1,768	267	3,449
Howard	398	250	1,592	136	2,926
Cecil	588	377	1,560	179	3,285
Baltimore	463	607	763	246	1,882

*United States Department of Agriculture estimates.
†Compiled from United States Census report for 1925.
‡Compiled from United States Census report for 1925; improved land not given in 1925.

Maryland ranks third among the States of the Union in the average annual production of wheat per square mile of the total land area, and fourth in the production of wheat per square mile of crop land and plowable pasture. Eight of the leading wheat producing counties in Maryland have a higher average production per square mile of land area than Kansas, the leading State according to this method of classification.

ACREAGE, PRODUCTION AND YIELDS OF WHEAT

TABLE II.

PRODUCTION OF WHEAT IN MARYLAND, BY COUNTIES.
(Average, 1920-1930)

State and Regions	Production (Bushels)	Percentage Distribution
STATE	10,000,000	100.0
Regions:		
Piedmont Plateau	5,650,000	56.5
Upper Eastern Shore	3,650,000	36.5
Southern Maryland	420,000	4.2
Lower Eastern Shore	200,000	2.0
Mountain	80,000	0.8

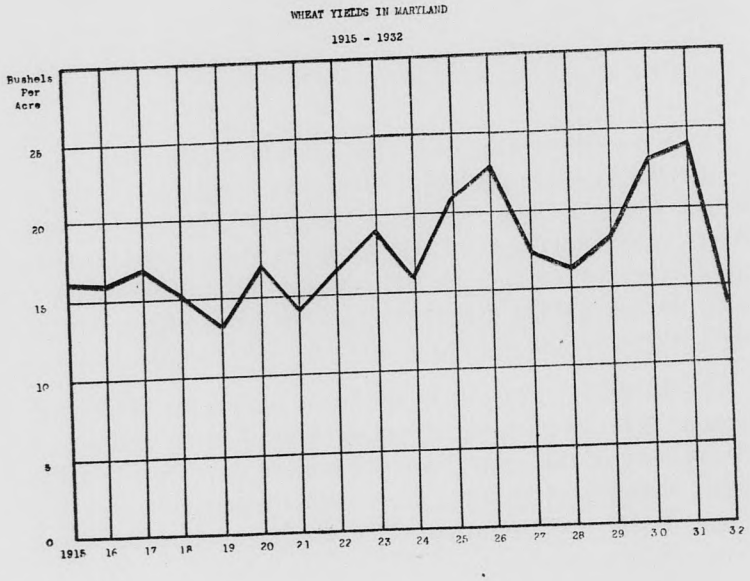
With respect to the production of wheat, Maryland may be divided into five regions, as follows: Piedmont Plateau, Upper Eastern Shore, Southern Maryland, Lower Eastern Shore, and mountain. Table II gives the normal annual production by regions for the decade 1920-1930, together with the percentage distribution of the total production in each region.

The Piedmont Plateau is the most important producing region. This is an area of intensive production and about 56 per cent of the total State production is centered in the seven counties of this region. Next in importance is the Upper Eastern Shore area, which produces normally about

36 per cent of the total State production. Together, these two regions produce about 92 per cent of the wheat grown in Maryland. In general, the farms in these areas are large and often wheat is grown two years in succession; that is, wheat often follows wheat in the rotation before being superceded by grass.

The acreage for the State has averaged about 565,000 acres except in the last two years. In 1931 the acreage was 404,000, and in 1932 it was 380,000 acres. The present economic depression, which has been accompanied by low prices of wheat, has had a direct effect on the wheat industry in the State. In 1932 it is estimated that the smallest acreage on record was harvested. The production decreased even more than the acreage. In 1931 the yield per acre was 24 bushels, but due to the reduction in the amount of fertilizer used and adverse weather conditions the yield for 1932 is estimated at only 13.5 bushels per acre.

CHART I.



From 1910 to 1919 the trend in yields per acre was practically stationary, but since 1919 the trend has been upward. The increased yield in recent years is no doubt attributed in a large part to the work of the Agricultural Experiment Station and the Extension Service in the testing of seed, improving the variety or strain, and in the better control of diseases. New strains or varieties of wheat which are more resistant to certain diseases have been developed and they are seeking their equilibrium in those sections of the State where the soil and climatic conditions are best suited to their growth and development.

The yield per acre in Maryland is normally higher than the average for the United States, and even higher than the yields in the other eleven States that produce soft winter wheat. For the twenty-year period, 1910 to 1929, the average yield in the State was 16.9 bushels, as compared with a yield of 14.4 bushels for the United States.

DISPOSITION OF MARYLAND WHEAT

Seed and Feed

During the decade, 1920 to 1930, the estimated requirements for seed and feed were 1,300,000 bushels, or about 13 per cent of the average production of 10,000,000 bushels for this period of time. Requirements for seed average about 760,000 bushels annually, and the amount fed to livestock to about 550,000 bushels. More wheat is fed in some years than in others. In years when the crop is small usually there is a larger percentage of poor and unmarketable wheat which is suitable only for feed on the farm. When wheat prices are low compared with other feedable crops the tendency is to feed more wheat.

TABLE III.

TOTAL AMOUNT OF WHEAT HELD ON MARYLAND FARMS FOR SEED AND FEED.

(Average for 1920-1930)

Production Regions	Bushels	Per Cent of Production
STATE	1,300,000	13.0
Piedmont Plateau Region	705,000	12.5
Upper Eastern Shore Region	450,000	12.3
Lower Eastern Shore Region	31,000	15.5
Southern Maryland Region	91,000	21.7
Mountain Region	23,000	28.8

MOVEMENT OFF THE FARM

Approximately 8,700,000 bushels out of a total production of 10,000,000 bushels move off the farm where produced; 3,100,000 bushels, or 31 per cent, are used locally in the regions where grown; 5,100,000 bushels, or 51 per cent of the crop, are shipped out of the State; the remaining 500,000 bushels, 5 per cent, go to the mills in Cumberland, to the mills on the Lower Eastern Shore, and through Baltimore to other mills within the State and for consumption in the city. As previously stated, about 1,300,000 bushels, or 13 per cent, are used on the farm directly as seed and feed.

TABLE IV.

MARYLAND WHEAT USED IN THE STATE

(Average for 1920-1930)

Item	Bushels
TOTAL	4,900,000
Used on the farm, first hand	1,300.000
Used directly in the regions	3,100,000
Piedmont counties	2,205,000
Eastern Shore counties	600,000
Southern Shore counties	159,000
Southern Maryland counties	79,000
Mountain counties	57,000
Shipped to Cumberland mills	50,000
Shipped to mills in Southern Shore	35,000
Shipped through Baltimore for—	365,000
Maryland mills	50,000
Local use	

TABLE V.

MARYLAND WHEAT LEAVING THE STATE.

(Average for 1920-1930)

Item	Bushels
TOTAL	5,100,000
To Southern mills	2,500,000
Direct from counties	2,000,000
Through Baltimore	500,000
To Philadelphia and other Pennsylvania points	1,290,000
From Eastern Shore	1,250,000
From Piedmont Section	40,000
To District of Columbia	310,000
From Piedmont Section	160,000
From Southern Maryland	90,000
From Baltimore	60,000
Exported to Europe or Latin America through Baltimore	1,000,000

Of the 5,100,000 bushels that are shipped out of the State, about 2,500,000 bushels go to Southern mills, 1,290,000 bushels to markets in Pennsylvania (mainly to Philadelphia), 310,000 bushels to Washington, D. C., and 1,000,000 bushels are exported through Baltimore.

In the Piedmont Plateau region about 5,000,000 bushels of wheat are marketed. Of the wheat marketed, about 2,200,000 bushels, or more than 40 per cent, are used in the region, most of which is converted into flour in the local mills; about 2,000,000 bushels are shipped directly to flour mills in the States along the Atlantic Seaboard south of Maryland, largely to Virginia and the Carolinas; and 500,000 bushels go into the elevators in Baltimore City.

The average total production for the Upper Eastern Shore region is about 3,650,000 bushels, of which 2,600,000 bushels are shipped away, half to Baltimore and half to Philadelphia; 1,050,000 bushels are used locally (530,000 in flour mills, 70,000 in feeds, and 450,000 on the farms).

Most of the wheat on the Eastern Shore moves to Market directly from the thresher. Prevalence of navigable water routes has caused in past decades a large movement of grain by boat across the Bay to Baltimore. About 900,000

bushels, or one-third of the total shipments, go to Baltimore by water. Convenient railroads offer easy outlets inland. When there is a strong demand from Southern mills, as during 1928 and 1929, the wheat moves to Baltimore. Otherwise, somewhat better rail connections attract a considerable proportion of it to Philadelphia.

In the Lower Eastern Shore region and in the mountain section practically all of the wheat is used on the farm and disposed of locally in feed and through flour mills.

In Southern Maryland about 60 per cent of the crop is shipped away, about 160,000 bushels going to Baltimore and 90,000 bushels to Washington, D. C.

MOVEMENT OF WHEAT TO AND FROM BALTIMORE

Total Receipts and Exports of Wheat at Baltimore

From 1919 to 1932 the total receipts of wheat at Baltimore averaged 18,814,000 bushels and the exports 16,609,000 bushels. Normally the receipts are about 2,200,000 bushels in excess of exports. Since 1927 both receipts and exports have declined. In 1932, the receipts of wheat on the Baltimore market were only 2,928,072, a decline of nearly 9,000,000 bushels as compared with 1931. Exports in 1932 were 6,799,874 bushels, a decline of nearly 2,500,000 over 1931. Very little wheat is now in the Baltimore elevators. Only 868,881 bushels remained in the elevators on January 3, 1933. For the first time since 1928 stocks went below 1,000,000 bushels.

TABLE VI.

RECEIPTS AND EXPORTS OF WHEAT AT BALTIMORE, 1919-1932.*

Year	Receipts (Bushels)	Exports (Bushels)	Receipts Less Exports (Bushels)
1919	26,575,331	26,040,071	535,260
1920	33,544,501	29,780,569	3,763,932
1921	23,229,056	21,748,196	1,480,860
1922	23,762,973	22,978,143	784,830
1923	21,331,569	19,415,387	1,916,182
1924	18,462,098	16,055,643	2,406,455
1925	15,853,000	15,342,462	510,538
1926	19,497,293	16,699,790	2,797,503
1927	21,817,250	19,991,757	1,825,493
1928	16,856,051	10,858,258	5,997,793
1929	16,394,178	10,716,036	5,678,142
1930	11,381,572	6,952,837	4,428,735
1931	11,769,995	9,149,186	2,620,809
1932	2,928.072	6,799,874	—3,871,802
Average	18,814,495	16,609,157	2,205,338

*Includes Canadian wheat shipped in bond.

Canadian wheat shipped in bond constitutes a large percentage of the total receipts at Baltimore. The percentage has varied in recent years from 96 per cent of the total in 1929 to 47 per cent in 1931.

TABLE VII.

TOTAL EXPORTS OF WHEAT AND EXPORTS OF CANADIAN WHEAT (SHIPPED IN BOND) FROM BALTIMORE, 1922-1931.

Year	Total Exports (Bushels)	Canadian Wheat Shipped in Bond (Bushels)	Per Cent Canadian Wheat
1922	22,978,143	.....	....
1923	19,415,387	15,532,309	80
1924	16,055,643	10,994,000	68
1925	15,342,462	9,103,218	59
1926	16,699,790	9,959,580	60
1927	19,991,757	11,946,974	60
1928	10,858,258	10,133,197	93
1929	10,716,036	10,321,952	96
1930	6,952,837	5,453,148	80
1931	9,149,186	4,288,132	47

RECEIPTS OF MARYLAND WHEAT AT BALTIMORE

The large terminal elevators in Baltimore perform the functions of storing, cleaning, drying, grading and treating

wheat because those services have not been developed in the counties.

For the years 1924 to 1929, 1,975,000 bushels of Maryland wheat were received at Baltimore annually, which was about 25 per cent of the marketable supply. About 1,000,000 bushels of Maryland wheat were exported from Baltimore annually during the years 1924 to 1929.

TABLE VIII.

MOVEMENT OF WHEAT FROM MARYLAND TO BALTIMORE.
(Average 1924-1929)

Producing Regions	Bushels
Piedmont Plateau Region	490,000
Eastern Shore Region	1,320,000
Southern Shore Region	5,000
Southern Maryland Region	160,000
Total	1,975,000

TABLE IX.

DISTRIBUTION FROM BALTIMORE OF MARYLAND WHEAT.
(Average 1924-1929)

Disposition	Bushels
Used within the city	50,000
District of Columbia	60,000
Maryland mills	365,000
Southern mills	500,000
Exported	1,000,000

COST OF PRODUCTION IN MARYLAND

Yield per acre is undoubtedly one of the most important factors influencing profits. Undoubtedly the last yield per acre in Maryland has been an important factor in maintaining wheat production in the State. It also fits into the rotation, provides a nurse crop for the hays and pastures, affords protection for the soil, and provides straw for the dairy cattle. Some farmers have stated that any loss in the wheat crop should be charged to the dairy enterprise.

In 1922 it cost 85 cents per bushel to produce wheat and in 1932, with the lowest yield in the last 22 years, the cost

per bushel was 71 cents. Had there been an average yield of 18 bushels per acre in 1932 the cost per bushel would have been 54 cents, or in other words farmers would have broken even, in spite of the low prices.

FARM PRICES AND BALTIMORE MARKET PRICES

Farm prices of wheat in Maryland follow rather closely the Baltimore market prices, which in turn are based on the Chicago prices. Buyers at country points in Maryland usually base their quotations on the market prices at Baltimore, the prices paid at country points approximating the Baltimore prices minus the cost of transporting wheat to Baltimore.

The price of wheat has always fluctuated, being determined by the equilibrium of the many forces of supply and demand. The principal factors constituting the supply of wheat are actual receipts at terminal markets, visible supply in elevators, estimated supplies in country elevators and on farms, world-wide crop estimates, shipments, exports the weather and influences outside the grain trade. Demand for wheat is made up of bids from millers, buyers and speculators, and is greatly influenced by the price and supply of substitutes.

PREMIUM ON SOFT WINTER WHEAT

With hard wheats, protein has become an important price factor. In soft wheats a lower protein content is rather desirable. The two kinds of wheat serve different purposes and to a certain extent are not competitive. For the last twenty years soft wheat has normally sold at a premium over hard wheat of equal grade, the amount of premium being governed largely by the production of soft winter wheat in relation to the production of hard wheats. Especially is the margin of difference great in years when the production of soft winter wheat is small as compared with the production of hard wheat. This is illustrated in Chart No. 2.

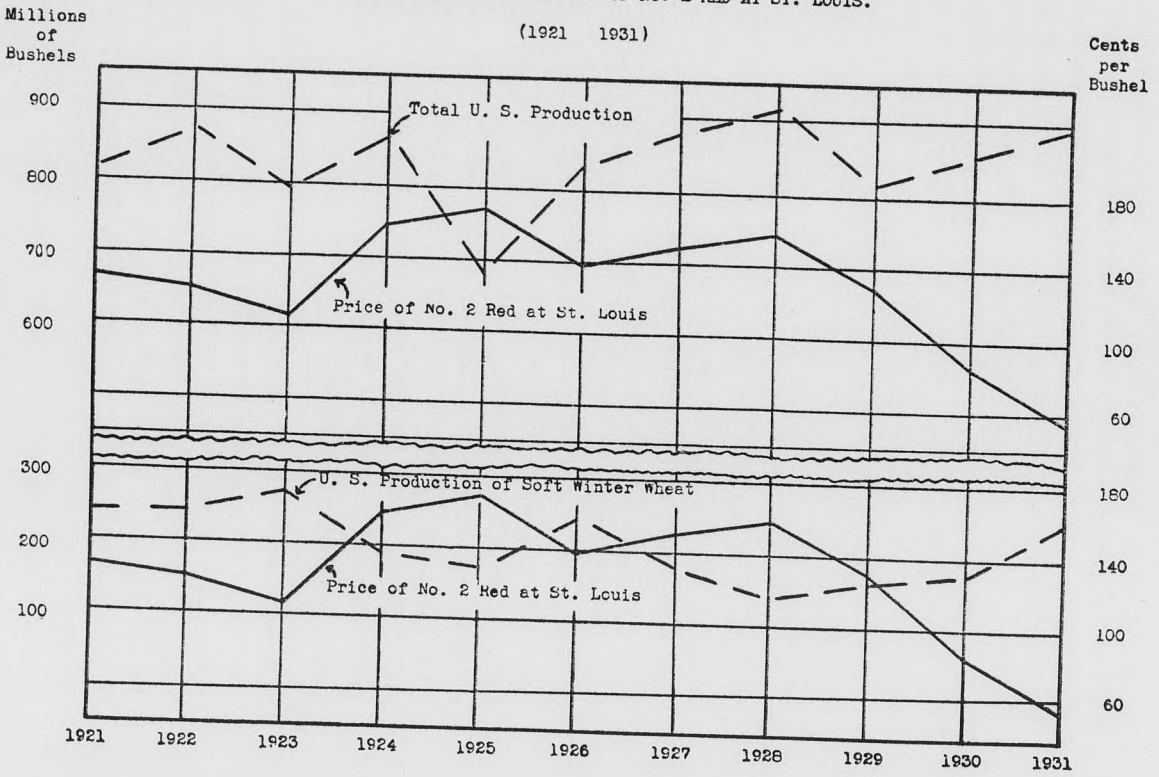
Chart II. In 1928 the production of soft winter wheat in the United States averaged only 140,000,000 bushels as compared with a total production of all wheat amounting to 912,000,000 bushels. The price differential in this year averaged 27 cents a bushel. Again in 1924, when the production of soft winter wheat averaged 184,000,000 bushels as compared with a total production of 862,000,000 bushels, the price differential in favor of soft winter wheat averaged 24 cents a bushel.

RELATIONSHIP OF THE TOTAL UNITED STATES PRODUCTION OF WHEAT AND THE

CHART II.

RELATIONSHIP OF THE TOTAL UNITED STATES PRODUCTION OF WHEAT AND THE PRODUCTION OF SOFT WINTER WHEAT TO THE PRICE OF NO. 2 RED AT ST. LOUIS.

(1921 1931)



The price of soft winter wheat in the United States and in Maryland is influenced more by the production of this class of wheat than by the total production of all wheats. This can be explained by the fact that soft winter wheat is used largely for domestic consumption and does not find its way abroad to any appreciable extent. Then, too, it is used specifically in the making of biscuits, pastry and crackers and does not come into direct competition with the hard wheats. Hard wheats, however, compete with the soft wheats indirectly because of the possibility of substitution or blending, and producers of soft winter wheat are therefore concerned with the outlook for other wheats.

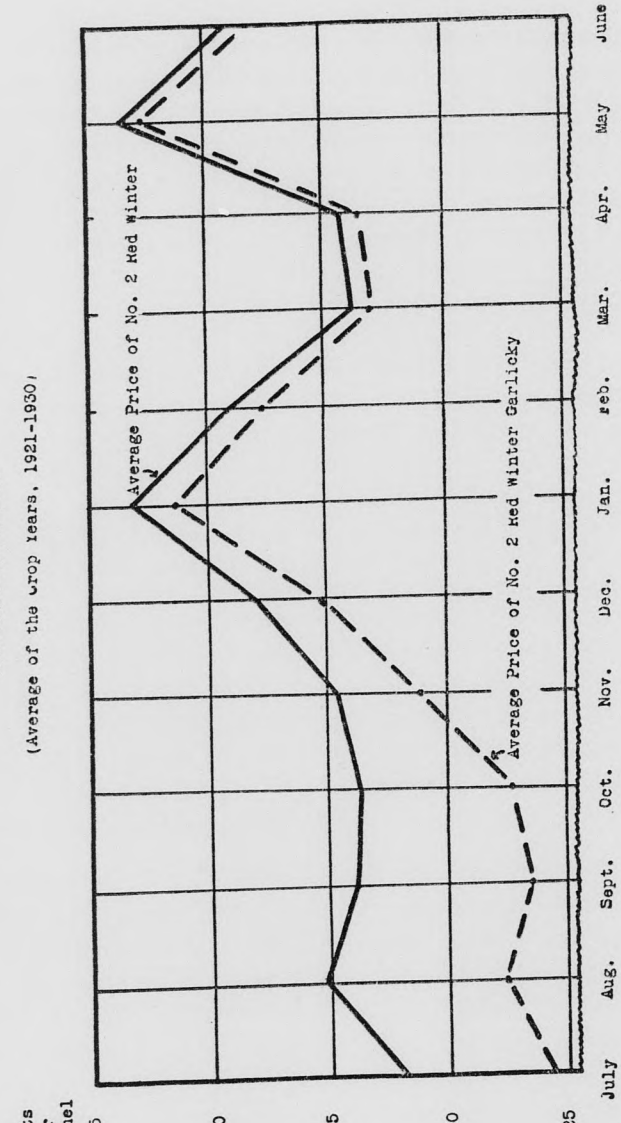
Chart II shows that the price of soft winter wheat fluctuates inversely with the production of soft winter wheat. This same chart also indicates that the price of soft winter wheat does not fluctuate always in inverse relationship to the total production of wheat in the United States. For example, the total United States production of wheat decreased in 1923 from the production in 1922, yet the price of soft winter wheat declined. The production in 1924 was considerably larger than that in 1923 while at the same time the price averaged 48 cents a bushel more than for 1923. Then, again, for the years 1927, 1928, and 1929 the price showed no inverse relationship to production, but rather a direct relationship.

Production of soft winter wheat for the years 1920 to 1929 was tabulated and correlated with prices. The results show a significant inverse relationship between the production of soft winter wheat and the weighted average price at St. Louis. The coefficient of correlation was —.764, with a probable error of ±.09. Then the total production of wheat in the United States was correlated with the prices of soft winter wheat at St. Louis. The inverse relationship here was much less noticeable, the coefficient of correlation being —.165, with a probable error of ±.23.

PRICES OF GARLICKY AND NON-GARLICKY WHEAT IN MARYLAND

The greatest difference between the price of No. 2 Red Winter and No. 2 Red Winter garlicky wheat occurs during the months of July, August, September and October. The average differential between these two grades of wheat on the Baltimore market averaged 6.9 cents a bushel for these months during the years 1921 to 1930. After October the price differential between the two grades of wheat gradually begins to disappear and in the early spring months prices of garlicky and garlic-free wheat are about the same. At time garlicky wheat actually sells for more on the market than garlic-free wheat of the same grade specifications, the garlicky wheat at these times being on a domestic basis and the garlic-free wheat on an export basis. During January and February, 1928, garlicky wheat sold for one cent more per bushel on the Baltimore market. This condition raises the question as to the advisability of storing garlicky wheat until the prices between the two grades become equalized.

CHART III.


MONTHLY SPOT PRICES OF NO. 2 RED WINTER AND NO 2 RED WINTER GARLICKY WHEAT ON
THE BALTIMORE MARKET
(Average of the crop years, 1921-1930)
Cents Per Bushel
145
140
135
130
125
Average Price of No. 2 Red Winter
Average Price of No. 2 Red Winter Garlicky
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June

Garlicky wheat prices from July to January present a unique situation which the average grain grower cannot afford to disregard. The usual 7-cent differential existing between the price per bushel of No. 2 Red Winter and No. 2 Red Winter garlicky at threshing time could be turned from a loss into a profit if storage costs from this period until an equalization of prices between the two grades occurs in January are not exhorbitant. The producer who stored garlicky wheat during this period of time would normally realize a profit of nearly 6 cents a bushel in addition to any increase in the price of No. 2 Red Winter which might occur.

DISTRIBUTION OF VARIETIES OF WHEAT IN MARYLAND

By DR. W. B. KEMP

If one were to select the time when wheat is ripe for an airplane trip from the Atlantic Seaboard westward across the State of Maryland, he would observe five different bands of color which correspond to the type zones within the State. Each wheat variety is confined, in its distribution, to the particular zone to which it is best adapted, while usually not more than three to five miles represents the overlapping boundary between these zones. Ten years ago the same trip would have revealed zones equally clear cut in their boundaries. However, the colors would have been different in some zones from those of today, and the boundaries in some instances would have occupied different locations.

In the latter part of the past century Fultz apparently was the predominant variety of wheat in the State, with Mediterranean and Fulcaster also occupying extensive acreage. As time went on, Currell slowly replaced Fultz, while Mediterranean gradually disappeared from the picture. For our present purpose let us pick up the story in 1918, just before the United States Department of Agriculture conducted its variety survey. The accompanying table shows the time from 1918 to 1931, inclusive, divided into four

periods. Also, it shows the average wheat yield per acre in the State for each of these periods, as well as a relative yield on the plots at College Park for the most favorable member of each important response type. Currell, of the Fultz response type, is used as the standard with a relative value of 100 for each period. Mammoth Red belongs to the Fulcaster group, while Leap and Forward fail to show close conformity to either of these types. However, Leap is much closer to the Fultz group than to any other.

MARYLAND WHEAT YIELDS

Year	State (Actual)	College Park (Relative)			
		Currell	Mam. Red	Leap	Forward
1918-21	15.8	100	124	108	....
1922-24	17.4	100	100	104	....
1925-27	20.8	100	84	93	....
1928-31	20.5	100	99	97	94

The earliest period in the table, from 1918 to 1921, inclusive, comprised a series of very poor wheat years, with an average State yield of 15.8 bushels per acre. During this time Mammoth Red (124) was producing very high relative yields with Leap (108), also above Currell. (In evaluating he numbers in his table, one must keep in mind the fact that College Park is situated in the Coastal Plain, where conditions are relatively favorable to the Fulcaster type and relatively unfavorable to Currell, with Forward still in an unknown position.) By 1922, after the period had closed, the Fulcaster type, to which Mammoth Red belongs, had pushed all other wheats out of the Coastal Plain and from the limestone valleys to the west of the Piedmont Plateau. In fact, at one spot between Damascus and Mount Airy, this type had pushed its way from the Frederick Valley to the top of Parr's Ridge. During this same period Leap was contesting with Currell, China, and Fultz for control of the Piedmont area.

The second period of the table, from 1922 to 1924, inclusive, comprised a series of years somewhat more favorable than the preceding one, with wheat yields for the State

averaging 17.4 bushels per acre. During this period Leap showed some superiority to both Currell and Mammoth Red at College Park, while in the State it succeeded in gaining control of all lower altitudes within the Piedmont Plateau. By 1925 Currell, with an occasional field of China or of Fultz, occupied only the highest altitudes of this region. The seven hundred foot contour on the map marks the approximate lower boundary of the area in which this type was able to retain foothold. During this same period also Leap was able to push down into the western edge of the Coastal Plain and to begin its march down the valley toward Hagerstown from the Pennsylvania boundary.

The third period of the table, from 1925 to 1927, inclusive, comprised a series of good wheat years, with the State yield averaging 20.8 bushels per acre. Conditions during these years were particularly favorable to the Fultz response type, as shown on the plots at College Park where Mammoth Red was able to maintain a relative yield of only 84 while Leap yielded at the rate of 93. During this period Leap conformed to expectation in its continued inroad into Fulcaster territory by pushing further into the Coastal Plain to the east, toward the Frederick Valley to the west, and toward Hagerstown from the Pennsylvania line. However, Currell, with its high relative yields at College Park, failed to make progress below the 700-foot contour in the Piedmont area. Either the relative yields at College Park were not a true criterion of those which prevailed at these higher altitudes, or else the farmers were loth to readopt that which they so recently discarded. However, the most surprising development during this period was the appearance of a few fields of Forward wheat in the area to which Currell was clinging so tenaciously. Before the close of the period this variety had been planted in the test plots at College Park. Hence its relative yield could be obtained there for the final period in the table.

This final period, extending from 1928 to 1931, inclusive,

was one of continued favorable conditions in the State, with a yield average of 20.5 bushels per acre. Currell had continued to outyield both Leap and Mammoth Red at College Park. However, the margin was very narrow. The relative yield of Leap was reduced materially by a particularly poor showing in 1931. In the State the slight changes in boundary between this variety and the Fulcaster type has been to the benefit of Leap. But the striking feature of this last period has been the behavior of Forward. At College Park this variety has not showed a relative yield so high as that of any of the other three. However, in the State it has so completely swept over that part of the Piedmont Plateau which lies above the 700-foot contour that scracely a field of the Fultz response type remains, while now it is contesting with Leap for that territory just below this contour.

A wheat variety map of Maryland prepared at the present time would show a cap of Forward covering the highest altitudes of the Piedmont Plateau with an irregular boundary extending, in places, to elevations below 700 feet. The lower altitudes of this plateau are occupied by Leap, which extends far enough into the Coastal Plain, on the east, to reach the Chesapeake Bay at many places, while on the west it reaches almost to the Monocacy River in the Frederick Valley, and south to Hagerstown in the valley west of the Blue Ridge Mountains. The remainder of the valley lands to the west, and of the Coastal Plain to the east, including practically the entire Eastern Shore area beyond the Chesapeake Bay, is occupied by the Fulcaster type.

One of the most surprising features of this study concerning wheat variety response within the State of Maryland is the keenness of mass community judgment within the farming population. When wheat varieties on the plots at College Park manifest a difference in yield level, even though this difference may be too small to show statistical significance, it may be accompanied by a change of position of many miles in the boundaries between these varieties throughout the State.

It would appear to be well worth while to endeavor to evaluate the various forces which result in this zoning of the State by wheat response types. Fulcaster is a bearded wheat and Currell tends to shatter bady when stored in the mow before threshing. Hence on any uniform level there is a tendency to discriminate against these two types. The boundaries of the areas devoted to any wheat type extend across soil type boundaries with a freedom that leaves to soil only a minor place among the controlling forces. Unquestionably elevation plays a leading role in locating boundaries. However, one is prone to question the extent to which this force associated with elevation is one of temperature on the one hand or of air drainage with its effect on diseases on the other hand. With Forward moving down from the North, it would seem logical to assume that temperature forces are associated with its restriction to the higher altitudes. However, among the other types that are considered, accumulated evidence points to differences in susceptibility to disease, particularly Septoria, as the main causal agency.

During the period from 1928 to 1931 that is shown in the table a new Leap selection with a behavior somewhat different from that of the parent has produced a relative yield of 108 against the parent 97 at College Park. This selection is now distributed under the name of Leapland. It will be most interesting to observe whether this new selection can check the inroads of Forward into Leap territory or possibly drive it back to the North, whence it came.

THE USE OF WHEAT IN MARYLAND

By PROFESSOR GEARY EPPLEY

Mr. Chairman, Members of the Maryland Crop Improvement Association and Guests: It is indeed a great pleasure to be here this morning and talk about such a wonderful crop of wheat. Wheat has been grown by man as far back as he has any record of his acts, and it will be grown as

long as man continues to exist. Wheat is fundamental. It might be called the basic food crop of the world, and as the price of wheat varies so does the price of all crops. The price of wheat started to decline in the boom period of 1926-27-28, and soon all others followed and may it lead them upward. Wheat has romance. The ancients celebrated their harvest with ceremonies and feats, and even today, regardless of the work involved, there is a certain thrill in harvesting and threshing wheat.

My subject is, "The Use of Maryland Wheat," and, of course, the main use is to mill it into flour; but I am not going to discuss that until a little later, as that will be taken up at the afternoon session. But I am going to try and bring out some of the uses of wheat that we do not generally think about, but just take for granted.

Maryland is a great wheat State and the wheat crop is vital to every citizen in the State. Any loss in the income from the wheat crop effects everyone in the State.

Wheat is the second most important crop in the State, being exceeded by corn. Maryland produces more wheat than any other State on the Atlantic seaboard except Pennsylvania, but the intensity of wheat production is greater in Maryland than Pennsylvania. Maryland produces 331 bushels per 100 acres of plow land. In 1919 Maryland ranked third in the United States in the number of bushels of wheat produced per square mile. The yield of wheat per acre is relatively high in Maryland, with a ten-year average of 17.4 bushels compared to 14.1 bushels for the whole United States. In 1926 Maryland ranked fourth in the United States in the yield per acre, being surpassed by the four irrigated States of Idaho, Utah, Nevada and Arizona. In 1931 and 1932 Maryland again produced twenty-three bushels per acre.

From the above mentioned facts the importance of wheat in Maryland is self-evident, and due to these facts Maryland is self-sustained as far as its flour supply is concerned.

On a per capita consumption of 171 pounds of flour per year per person, these figures are the estimate of the Department of Agriculture. Maryland needs 6,623,955 bushels of wheat to feed its people. Taking the figures of the 1929 census we produce this much wheat and have 1,178,045 bushels to spare. Of course the amount of wheat Maryland produces does not amount to much from a national standpoint because the whole crop might be wiped out and the national supply would not be effected, but it would be a calamity to Maryland farmers.

Not only would the failure of the wheat crop be a calamity to the farmer, but to all merchants and bankers as well. In fact, the reduced income of the farmers from wheat has hurt business in Maryland. In 1927, 1928 and 1929 the income from wheat was $11,000,000; in 1930, $9,000,000, and in 1931, $5,000,000. This reduction of a six-million dollar income means six million dollars that was not put in circulation. The farmer did not have the money to spend for new equipment, automobiles, clothes, radios, and what not—hence the local merchant lost his profit, clerks were not needed, so they lost their jobs; manufacturers could not sell the local merchants, the railroad lost business, and so on down the line. It is therefore evident that the wheat crop, which in normal time is a ten-million dollar industry, has a marked effect on the prosperity of the State as a whole. Maryland has reduced her acreage 100,000 acres. Some of this has gone into barley, which is an intelligent change over; but if this land has been abandoned it has lessened the income of all concerned and has not helped the national situation. While we, along with the other Eastern States and some States like Minnesota, have reduced our acreage, the Southwestern States have increased their acreage and the national surplus increases, causing a lower price for our smaller crop, hence a greatly reduced income.

Besides its great economic importance, wheat has a great use in the general rotation system of Maryland farms.

Figures on the cost of crop production are very interesting and usually show a loss. When wheat was selling for $1.25 to $1.50 we heard how the farmer was losing money, but he continued on. Later the price dropped and he was losing money at $1. Now it is at 56 cents and we are planting the same acreage as last year. If the farmers lost all their money, figures have shown at various times that they would have been bankrupt long ago, but wheat is really not such a losing crop, and if a farmer breaks even on the crop it is to his advantage to grow it.

Wheat fits into the rotation as no other crop will, except one of the other winter grains. It prevents erosion, and that is a very important fact as brought out by recent facts published by the United States Department of Agriculture. The Secretary of Agriculture states that 500,000,000 tons of soil have been washed away and 17,500,000 acres of land have been destroyed by erosion. Further, it is stated that over 75 per cent of all cultivated land is effected. In other words, farmers are losing wealth annually and wheat is a crop that is trying to hold that soil wealth for the farmer.

Wheat occupies the land only a small portion of the year, when any other crop would be growing. It carries a large cost of the hay crop. All the preparation of the land for hay is charged to the wheat, rent for a year is usually charged to wheat, whereas a good part of the year the hay crop occupies the land in whole or in part. The cost of the commercial fertilizer for the whole rotation is usually charged to the wheat crop. Wheat on some of our farms furnishes winter pasture, and according to an experiment conducted by A. F. Swanson of the United States Department of Agriculture it was found that judicious pasturing of wheat did not hurt the crop. Wheat furnishes the straw that is so needed on the farm and which in turn adds much needed organic matter to the soil.

It is very evident from the vital uses of wheat why farmers continue and should continue to grow this basic crop.

It is not the purpose of this paper to tell the merits of flour milled from Maryland wheat, but I wish to include the results of a survey I recently made of what happens to the wheat milled in Maryland.

One hundred per cent of the output of nineteen millers was straight and patented flour from Maryland wheat. Ninety-five per cent to seventy-five per cent of the output of six millers was from Maryland wheat, and only two millers used less than seventy-five per cent Maryland wheat, which shows that the local miller appreciates the quality of Maryland wheat. Fifteen millers put out a pastry flour. Fourteen millers put out a bread flour. Twenty-four millers use a special trade name and only two do not. Eleven millers report that 100 per cent of their output is consumed locally, twelve report 99 to 75 per cent, five report 50 to 25 per cent, and seven report that less than 25 per cent is consumed locally.

Summed up briefly, these figures indicate that millers and consumers both appreciate Maryland wheat and it has a place as a pastry flour and a bread flour to some extent.

Wheat in Maryland is an important crop to the farmer and to the miller, and it has a special place in that industry. In order that the great wheat industry of Maryland may continue at a high level of efficiency, there should be greater co-operation between the grower, miller and consumer.

SECRETARY'S REPORT

The State Corn Show was held as usual in connection with these meetings. The total entries of corn was 126 as compared with 141 the year before and with 109 in 1931. There were in addition eight entries of soybeans.

The State Potato Show of certified seed potatoes, sponsored by the Maryland Vegetable Growers' Association, was held in co-operation with the Corn Show. There was a total of 36 entries of potatoes.

The total number of exhibits in each class was as follows:

Class	I.	Reid's Yellow Dent Corn	25 entries
Class	II.	White Dent Corn	12 entries
Class	III.	Golden Queen and Similar Corn	21 entries
Class	IV.	Other Varieties of Yellow Corn	18 entries
Class	V.	White Cap Corn	9 entries
Class	VI.	Single Ears (any variety)	35 entries
Class	VII.	For Junior (any variety)	6 entries
		Total corn entries	126
		Total soybean entries	8

The Corn Show made an unusual fine appearance this year, not only on account of the excellent quality of the corn exhibits, but also because the hotel management was able to provide ample room for the corn so that the samples could be well displayed.

The judging was again done by Professor George Schuster, Agronomist of the University of Delaware, and Professor Geary Eppley of the University of Maryland.

THE SPECIAL AWARDS

The Sweepstakes ribbon for the best exhibit of yellow corn was won by Denton Warehime of Westminster, Maryland, with an exhibit of Golden Queen corn.

The Sweepstakes ribbon for the best exhibit of White Dent corn was won by Ira V. McKenzie of Cumberland with an exhibit of Johnson County White corn.

The Grand Sweepstakes ribbon was awarded to the latter. With the ribbon went the Association trophy, a silver water pitcher, with the following engraving:

AWARDED BY THE
MARYLAND CROP IMPROVEMENT ASSOCIATION
TO IRA V. M'KENZIE FOR THE BEST EXHIBIT OF CORN AT THE
STATE CORN SHOW, BALTIMORE, JANUARY, 1933

BUSINESS MEETING

At the business meeting held at the close of Thursday's meeting, the following officers were elected for 1933:

President—Dan Pearce, Sparks, Md.
Vice-President—John Crum, Walkersville, Md.
Secretary-Treasurer—F. W. Oldenburg, College Park, Md.

In addition to their other duties the president is to represent the Association on the Board of Directors of the Agricultural Corporation of Maryland and the vice-president is to represent the Association as a member of the executive committee of the State Farm Bureau Federation.

The following is a complete list of the winners at the State Corn Show held at the Lord Baltimore Hotel, January 4 and 5, under the auspices of the Maryland Crop Improvement Association:

CLASS I—REID'S AND REID'S TYPE CORN:

1st —Ira V. McKenzie, Cumberland.
2nd—Dr. Dickinson Gorsuch, Timmonium.
3rd—Roland Davis, Street.
4th —Chas. L. Davis & Son, Street.
5th —Mrs. Eva Werner, Cumberland.
6th —Maynard Hawker, Frederick.
7th —William Goldsworthy, Long.
8th —Roy Crum, Frederick.
9th —Matt Harding, Cambridge.
10th —David Spencer, Westminster.

CLASS II—WHITE DENT CORN:

1st —Ira V. McKenzie, Cumberland.
2nd—William Goldsworthy, Long.
3rd—M. V. Goldsworthy, Long.
4th —Billy McKenzie, Cumberland.
5th —E. B. Milburn, Elkton.
6th —Fred C. Jones, Darlington.
7th —Robert Sherman, Cumberland.
8th —Mabel Werner, Cumberland.
9th —Eva Werner, Cumberland.
10th —J. W. Milburn, Elkton.

CLASS III—GOLDEN QUEEN AND SIMILAR TYPES:

1st —Denton Warehime, Westminster.
2nd—Walter Warehime, Westminster.
3rd—Norma Warehime, Westminster.
4th —Lida Arbaugh, Westminster.
5th —F. S. Grove, Westminster.
6th —John E. Crum, Walkersville.
7th —I. W. Matthews, Sparks.
8th —Masonic Home, Cockeysville.
9th —Eleanor Galt, Westminster.
10th —David Spencer, Westminster.

CLASS IV—OTHER YELLOW DENT CORN:

1st —Denton Warehime, Westminster.
2nd—Eva Werner, Cumberland.
3rd—Eleanor Galt, Westminster.
4th —Ira V. McKenzie, Cumberland.
5th —Walter Warehime, Westminster.
5th —M. V. Goldsworthy, Long.
7th —Billy McKenzie, Cumberland.
8th —Mabel Werner, Cumberland.
9th —Robert Sherman, Cumberland.
10th —George Tracy, Westminster.

CLASS V—WHITE CAP CORN:

1st —M. V. Goldsworthy, Long.
2nd—Mellor Ward, Jarrettsville.
3rd—Eva Werner, Cumberland.
4th —Ira V. McKenzie, Cumberland.
5th —Robert Sherman, Cumberland.
6th —Mabel Werner, Cumberland.
7th —Billy McKenzie, Cumberland.

CLASS VI—SINGLE EAR—ANY VARIETY:

1st —Fred Jones, Darlington.
2nd—Roland Davis, Street.
3rd—Robert Sherman, Cumberland.
4th —Dorsey Harding, Cambridge.
5th —Matt Harding, Cambridge.
6th —Mabel Werner, Cumberland.
7th —C. D. Davis, Street.

CLASS VII—JUNIOR CLASS—ANY VARIETY:

1st —Edgar Grubb, Poolesville.
2nd—Everett Snyder, Sparks.
3rd—James Whitecraft, Sparks.
4th —Vernon Wilkins, Willards.
5th —Alexander Cockey, Glyndon.
6th —Chas. Albright, Reisterstown.

CLASS VIII—SOYBEANS:

1st—Mabel Werner, Cumberland.
2nd—Billy McKenzie, Cumberland.
3rd—M. V. Goldsworthy, Long.
4th—William Goldsworthy, Long.
5th—James G. Stephens, Creagerstown.
6th—Robert Sherman, Cumberland.

TREASURER'S REPORT

MARYLAND CROP IMPROVEMENT ASSOCIATION

January 1, 1932, to December 31, 1932.

RECEIPTS:

Book balance January 1, 1932	$ 18.17	
Appropriation from Agricultural Society	305.30	
Dues paid by members	15.00	
Dues taken from awards	39.00	
		$ 377.47

EXPENDITURES:

Awards	$ 180.00	
Keystone Printing Company	24.00	
Torsch & Frantz Badge Co.	10.80	
W. R. Ballard awards for Vegetable Show	60.00	
Reimbursement F. W. Oldenburg, labor at Corn Show	3.00	
Farm Bureau dues	20.00	
Postage	1.90	
Trophy, Woodward & Lothrop, 1933 Show	17.50	
Dues taken out of awards		
		$ 356.20
		$ 21.27
Tax on checks		.10
Book balance, January 1, 1933		$ 21.17
Outstanding checks (trophy, 17.50; awards outstanding since 1930, $3.00)		20.50
Bank balance, December 31, 1932		$ 41.67

We, the undersigned, have examined the books of the Treasurer of the Maryland Crop Improvement Association and have found them to be correct.

L. C. BURNS,
FRED C. JONES.

REPORT

OF THE

Twenty-fourth Annual Meeting

OF THE

Maryland State Beekeepers' Association

Lord Baltimore Hotel

January 4, 1933

BALTIMORE, MARYLAND

The twenty-fourth annual meeting of the Maryland State Beekeepers' Association was called to order by Vice-President William M. Aman, at the Lord Baltimore Hotel, January 4, 1933.

In the absence of President A. H. Johnson, who was ill and unable to attend, his annual report was read by Dr. E. N. Cory. Mr. Johnson's report reviewed the association's activities for the year, special reference being made to the quality of the fair exhibits and the success of the association's meetings.

There followed the Secretary-Treasurer's report for the year. Following the financial report Dr. Cory spoke briefly urging closer co-operation among the members and greater activity in gaining new members.

A report of the year's Extension activities was given by George J. Abrams, Specialist in Beekeeping of the University of Maryland.

The program continued with a talk by Harold L. Kelly, entitled "Some of My Experiences in Beekeeping," in which he discussed "forced supercedure," winter packing and

stores under Maryland conditions and defended Tulip Tree honey as an excellent table honey.

There followed a timely talk by Dr. C. E. Burnside in which he discussed two bee diseases of lesser importance which have been reported in Maryland. Dr. Burnside described research being done by the U. S. Bee Culture Laboratory on an adult disorder of bees commonly referred to as "paralysis" and an obscure and little understood malady sometimes affecting the brood.

A movie entitled "The Realm of the Honey Bee" was shown with the permission and assistance of the U. S. Department of Agriculture.

There followed the annual election of officers. Harold L. Kelly, Forest Glen, was elected President for the coming year. S. G. Crocker, Jr., Baltimore, was elected Vice- President. Dr. E. N. Cory, was re-elected Secretary-Treasurer, Dr. J. R. Abercrombie, Baltimore, was elected Director and George J. Abrams, delegate to the Seventeenth Annual Convention of the Maryland Agricultural Society-The Maryland Farm Bureau Federation.

The Secretary was instructed to send a letter to Mr. A. Howard Johnson, expressing appreciation of his untiring efforts in fostering the work of the association during his term of office, and wishing him a speedy recovery from his recent illness.

The Secretary was authorized to send a $5.00 subscription to the Honey Institute.

A motion was made and carried to send the Rennert Hotel the usual amount of honey in appreciation of their kindness in supplying a room for the association meetings.

It was moved and carried that our delegate to the Maryland State Agricultural Society-The Maryland Farm Bureau meetings be instructed to favor a reduction in association dues.

The next meeting was set for March 11, 1933.

Meeting adjourned at 11.15 P. M.

ANNUAL ADDRESS BY THE PRESIDENT

A. HOWARD JOHNSON,

Centerville.

Fellow-Beekeepers:

In making this annual report of our activities during 1932, I must note at the beginning the inactivity of your president during the last six months of the year. I was in attendance at the Kent-Sussex Fair at Harrington, Delaware, during the last week in July and attended the Timonium Fair for one day. Since then my work for the Association has been nil.

I was away from the county until the last of September, at which time I was taken ill and spent eleven weeks in the hospitals of the Eastern Shore and Baltimore. It is with deep regret that I cannot be with you tonight at this our annual meeting. It is the first annual meeting I have missed since I became a member of the Association.

My clover honey had been taken off of the colonies before I was taken ill and, thanks to Mr. Vance and Mr. Abrams, it was thoroughly fumigated and the bees, I understand, went into the winter in good shape. I have not been out to see them as yet, but I am mighty anxious to do so.

We have made some progress during the past year, which I am sure the report of Mr. Abrams will show, especially in inspection of apiaries and also in the work of pollination in co-operation with the fruit growers.

We have held regular meetings in Baltimore, which have been well attended by the beekeeprs within driving distance. The meetings have been instructive and entertaining. Good programs have been provided and on nearly every occasion we have had well-known speakers to address us.

Our May meeting was held at the home yard of our former president, Mr. Lloyd Shearman, near Glen Arm. Here we

had a most enjoyable day. The weather was fine and the Shearman family gave us a warm welcome. Our friend, N. W. James of Baldwin, was the speaker of the day and gave us a wonderful talk on producing "Comb Honey."

I know from personal experience of last year that it is a good thing to have your beekeeper friends visit your yards, and when I saw the newly painted equipment and the freshly cleaned yards, I know that Lloyd Shearman was enjoying the same benefits that I did a year ago.

We can all very easily persuade ourselves to postpone doing things which should be done. So, I will be glad to have you all come back to see me on the Eastern Shore next summer, either as individuals or as an Association meeting. I know that I will be benefited by such a visit.

The June meeting was held at the Bee Laboratory of the United States Department of Agriculture at Somerset, Maryland. It was well attended and most interesting. We thank Mr. Hambleton and his staff for their cordial welcome and the pleasant and instructive day spent with them. It is always a pleasure to visit Somerset.

The Eastern Shore meeting was held at Denton in Caroline County and was sponsored by the Caroline Chapter of the State Association. The morning session was held in the Court House, at which time moving pictures of bee activities were shown before a large and enthusiastic audience. We then adjourned to the home of Mr. Martin Voss, president of the Caroline Chapter, where a picnic luncheon was served and the afternoon meeting held. The principal talk was given by Hon. T. Alan Goldsborough, Congressman from Maryland representing the Eastern Shore, after which games were played and the bee catching contest held, in which Mr. Andrews regained the crown lost to Mr. Vance last year. Mr. Goldsborough also received a couple of good stings. We missed a number of our Western Shore friends at this meeting. Of course, the majority present were from the Eastern Shore, which was as it should have been, but

we are always glad to have our beekeeper friends from the Western Shore come to see us.

The exhibits at Harrington for the Kent-Sussex Fair were fine; the best ever. We were told that the exhibit attracted much more attention than any other on the grounds. As usual, most of the prizes were captured by Maryland exhibitors, but the Delaware beekeepers did well in view of the number of exhibits made by them. There were more than 100 exhibits with about 35 exhibitors.

Our exhibits at Timonium were very much improved, both in number and quality. This was fine and we still ask for more in 1933. Bring your exhibits and come to the fair. Meet the people and talk honey. There is no better place in Maryland to reach as many prospective customers as at Timonium.

Exhibits were made also at the Belair and Frederick Fairs, which drew attention and favorable comment.

I have not had a report on Honey Week, but Mr. Abrams was on the job, making several radio talks and doing his part in forwarding honey sales. In our county, exhibits were made at several points.

The honey crop for the past year was one of the best we have ever had on the Eastern Shore; the quality was fine and in quantity ranked with the best.

Mr. Abrams has given much of his time during the past year to individual beekeepers, and we hope that during the coming year even more time can be used along these lines. He can only make headway when you, as members, help him. With the number of persons interested in beekeeping in Maryland, we should have at least 250 paid-up members. This can only be accomplished by every member putting his shoulder back of the proposition and seeing that every beekeeper he knows becomes a member. We can only hope for continued aid from the State and Extension Service by our aid to them. If we are not interested in our own welfare, certainly we cannot expect them to assist us.

How many members have you gotten in 1932?

How many members will you get in 1933?

Dr. Cory, our secretary, has given liberally of his time to our work. We certainly owe him a vote of thanks. I would like to have a suitable letter sent to the Hotel Rennert for their co-operation in allowing us to meet there for our monthly meetings.

It was a pleasure to have a number of my beekeeper friends come in to see me while I was in the hospital in Baltimore. It helped a lot. Thanks, fellows.

I want to extend to one and all my sincere thanks for the loyal support which has been given me during my term of office as your president, and I ask for the same assistance to my successor. I pledge him mine.

FINANCIAL STATEMENT

JANUARY 4, 1933

On hand January 6, 1932	$25.72
Dues received for 1932	43.00
Journal subscriptions received	6.50*
Total	$75.22

EXPENDITURES

W. J. Nolan, expenses to meeting	$2.55
American Honey Institute, contribution	5.00
Maryland Farm Bureau Federation, 1931 dues	20.00
Bee Journal	6.50*
Check returned	1.50
Total	$35.55
Balance January 4, 1933	$39.67

*$2.50 not deposited, but sent directly to Journal in money orders.

REPORT OF EXTENSION SPECIALIST IN BEEKEEPING

GEORGE J. ABRAMS,

College Park.

During the past year, 106 visits were made with beekeepers and in approximately 90 per cent of these visits actual

work was done with the beekeepers in the apiaries. It was questionable, at first, whether or not the cost of this method of teaching apiary management, while admittedly superior to any other method, would be too great. By planning efficient itineraries and combining the educational work with trips made in the interest of disease control, orchard pollination and National Honey Week, it was possible to teach modern beekeeping methods at a minimum cost. There can be no doubt but that the value of personal instruction and demonstrations in the apiary are commensurate with the cost involved.

The major problems attacked were the wintering problem, spring management, swarm control, and disease detection and eradication.

One or more of the following drawbacks to successful beekeeping were found to prevail in the majority of cases where something definitely handicapped or militated against profitable production:

1. Poor wintering of colonies, due either to attempts to winter weak colonies, inadequate brood rearing in the fall, insufficient stores or inadequate protection.

2. Poor spring management, either as a result of poor preparation for winter, old queens, poor or insufficient equipment, wrong colony manipulation and lack of spring stimulation.

3. Excessive swarming because of ignorance of causes of swarming or swarm control methods, and a belief that swarming is either necessary or actually beneficial.

4. Presence of disease with its period of colony weakening and ultimate colony loss.

5. General tendency on part of beekeeper, particularly the farmer-beekeeper and side-liner to keep more colonies than he has time to manage properly.

6. Home-made hives or box hives.

7. Insufficient equipment (hive bodies, supers, frames).

8. Poor stock, old queens.

9. Poor frames, due to lack of use of full sheets of foundation, damaged frames, or pollen-bound frames.

10. Unfamiliarity with nectar sources, dates and length of bloom and relative values of nectar secreting flora.

Supplementing the personal instructions and demonstrations, eight beekeepers' meetings were held at which timely talks were given by the extension specialist and guest speakers on pertinent phases of mangament.

Timely mimeographed letters containing warnings and timely advice were sent to all beekeepers on the mailing list.

Two radio talks over Station WBAL, Baltimore, were given on special phases of apiary management.

Infectious bee diseases of economic importance were located, through inspections, in the following eight counties: Prince George's, Montgomery, Washington, Queen Anne's, Caroline, Wicomico, Baltimore and Harford.

Inspections of necessity were limited, with few exceptions, to those apiaries for which requests for inspection were received and to those apiaries in which infection was found the previous year.

Reinspections showed nine old (1931) centers of infection to have been cleaned up and a recurrence of disease in five old centers. In these five cases of recurrence of disease, the number of infected colonies was small, ranging from one to five. These infected colonies were summarily destroyed. Ten new centers of infection were discovered, the colonies involved being promptly destroyed in nine cases, while the colonies involved in the remaining center were given remedial treatment.

All figures refer to American Foulbrood with the exception of the two colonies treated, which were infected with European Foulbrood.

There follows a summary of the inspection work:

Apiaries inspected	56	Colonies diseased	33
Apiaries diseased	15	% colonies diseased	5.3
% apiaries diseased	26.8	Colonies destroyed	31
Colonies inspected	621	Colonies treated	2

While the per cent of colony infection appears low, the high per cent and wide geographical distribution of diseased apiaries (centers of infection) is of great significance.

Because of the lack of funds it was not possible to carry out area clean-up campaigns as planned.

At all times educational work on bee diseases was stressed. In apiaries where disease was located every effort was made to train the owner-beekeepers in the diagnosis of disease and the method of eradication. This personal instruction was supplemented by talks on diseases at meetings.

It is of interest that two diseases, either new to Maryland or previously unencountered or overlooked, were located during 1932. Samples were submitted to the U. S. Bee Culture Laboratory for examination, one of which was diagnosed as "paralysis" for want of a more descriptive name. This is an adult bee disease, apparently the same which caused great losses this year in the Southern States, particularly Georgia. Practically nothing is known regarding the cause of this malady. The other disease, as yet unnamed, affects the brood and was found to be rather widespread in Maryland, although causing only unimportant losses. This was diagnosed as a disease prevalent in the Southern States. Recent research seems to indicate that it is caused by some sort of floral poisoning. The one case of "paralysis" was isolated for observation.

Activity in honey marketing and publicity was limited to fair exhibits, the National Honey Week Program, and publicity through radio talks.

Some opposition was encountered in regard to the Honey Week Program in Baltimore City on the grounds that there was only a small carry-over of honey from the 1931 crop,

that honey was moving steadily and that any publicity would result in helping and encouraging the sale of Western honey, which is being sold at several cents below the prices asked for Maryland honey. However, some of the beekeepers in Baltimore County and many elsewhere who arranged exhibits in 1931 were anxious to repeat them this year.

A suitable poster, urging and emphasizing the use of Maryland honey was prepared by the Extension Service, and copies sent to all beekeepers who set up exhibits the previous year.

Three fair exhibits were arranged with the co-operation of the beekeepers. The number of entries in the various classes increased over previous years and the competition was exceptionally keen. Mr. George Marvin of the U. S. Bee Culture Laboratory acted as judge at the Timonium Fair, and the Maryland Extension Specialist judged at the Harrington (Delaware) and Harford fairs.

Three weeks were devoted to interviewing orchardists and making recommendations for either the permanent or temporary installation of bee colonies for pollination purposes.

Thirty-five orchardists were visited during this period, and in each case genuine interest was shown in the work. Approximately one-third of the orchardists visited were found maintaining colonies for their pollination value. Approximately another third of the orchardists visited were induced either to buy for permanent use or rent colonies for the period of fruit bloom. The remaining third were obviously interested, but decided not to go to added expense this year, feeling that the economic pressure of the times necessitated curtailing all production costs.

In those cases where orchardists already owned colonies, extension work took the form of inspection for colony strength, directions as to the placing in the orchard, recommendations as to needed equipment and advice relative to management.

In those cases involving the buying or renting of colonies, the extension worker acted as intermediary between beekeeper and orchardist. Colonies were located for those orchardists desiring same, were inspected for colony strength, and recommendations were given for their transportation, and time of placing and removal.

The progress made and interest shown in this phase of the work was encouraging when it is taken into consideration that the work was inaugurated during a year when every effort was being made to reduce production costs.

Beekeepers favorably located near large fruit producing areas were encouraged to prepare themselves to be in position to rent colonies in succeeding years.

The four outstanding meetings of the year were the annual meeting held in Baltimore, the Baltimore County field meeting at Glen Arm, the annual field meeting at the U. S. Bee Culture Laboratory, Somerset, and the Eastern Shore field meeting held at Denton.

As in previous years, the Association was fortunate in being able to have workers of national prominence in apiculture address the members. The U. S. Bee Culture Laboratory co-operated generously in supplying speakers.

Two spring and two fall meetings were also held, making a total of eight meetings for the year.

It has been clearly demonstrated that from an extension standpoint field meetings, held in the apiary, are of greater value than indoor meetings. Superiority of the field meeting lies in larger attendance, opportunity to inspect equipment and witness demonstrations, and a greater opportunity for social contact and conversation with other members of the profession.

The monthly indoor Baltimore meetings were curtailed and limited to four in an effort to decrease the cost of this phase of extension work, the value of which was not considered commensurate with the expense involved. Should

increased interest be shown in winter indoor meetings, they will be held during the coming year; otherwise, it is deemed expedient to limit the winter meetings to the one annual meeting held in January and increase the number and range of the late spring, summer and early fall field meetings.

Members of the association were directly responsible for the educational and advertising value derived from the Timonium, Harrington, (Del.), and Harford fair exhibits of bees and honey.

EXPERIENCES IN BEEKEEPING

By HAROLD L. KELLY.

Text books are of great assistance to the beekeepers, but, if he would keep pace with the industry, he must be a constant reader of the bee journals and attend the beekeepers' meetings. I have never read a bee journal or attended a meeting without adding to my general knowledge of beekeeping, and, if one is not a good observer himself, he can learn much from those who are, and with whom he will make contacts in the journals and at the meetings.

You will recall the talk given by Mr. James last summer at our field meeting at Glen Arm. One question answered by Mr. James, I believe, has solved the swarming problem for me. One of my best colonies had superceded their queen without casting a swarm. I inquired of Mr. James if this colony could be operated for comb honey without danger of swarming. It was his opinion that this could be done and he stated his reasons. The colony produced a good crop of comb honey without making any effort to swarm and without any other swarm preventive measures being taken. It then occurred to me that, if this had come about naturally, why could not such a condition be brought about artificially? I became enthused over the prospect of the

discovery of a "sure fire" swarm prevention manipulation, until I read Jay Smith's article in the next issue of *Gleanings in Bee Culture* (July, 1932) and found that I was trying to discover something that had been discovered and published years before, but had escaped my notice. Jay Smith described this plan also in the May, 1925, issue of *Gleanings.* The bee journals for the past year have had a great deal of comment on this forced supercedure plan of swarm prevention, and it appears that very little attention has been given to it until this season. Mr. Demuth tried the plan out and comments upon it in one of his editorials in the August issue of *Gleanings in Bee Culture.*

The principle of the plan is to cause the bees to supercede the old queen in time to have the new queen well started in laying at the beginning of the honey flow. This is done by various methods of raising and mating a queen in an upper story and transferring her to the regular brood nest after removing the old queen. The introduction of a young queen does seem to produce the desired results. The new queen *must be raised in the hive she is to head.*

However, "all is not gold that glitters." Those who have tried this plan report some disappointments. The virgin queen often has the habit of carrying a small swarm with her on her mating flight, or becomes lost. This results in a failure of the plan for that particular colony, but apparently no harm has been done as the colony still has the old queen. Where the young queen successfully mates, swarming ceases to be a problem for the season and a larger crop is assured, either comb or extracted.

Dr. C. C. Miller comments on the possibility of swarm prevention by the supercedure plan in his "Fifty Years Among the Bees," so the thought is not a new one, but is just beginning to receive attention.

Another advantage of this method of swarm control is that you get your requeening done at the same time and at a season when robbing is not a problem.

I can now recall having seen natural supercedure take place before the honey flow in past years, but not being as good an observer as I might have been, I failed to connect the apparent non-swarming qualities of a particular colony with the supercedure act.

Requeening is not a very pleasant job after the honey flow, particularly if you have hybrids. Last summer I found it almost impossible to get hybrid colonies to accept a queen. Some positively refused to accept the queen, though nearly every orthodox method of introduction was used. Some were determined to raise their own queen, and after they had killed several queens I decided to let them have their own way and raise a queen to their liking, which they did. Had I tried to requeen during the honey flow, I probably would have been more successful. However, few beekeepers have time for this work during the honey flow. For that reason I am enthused over the possibilities of the forced supercedure plan.

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Methods of wintering bees is a subject upon which you will find a difference of opinions, which change as years pass.

It was not so many years ago that heavy packing was recommended for this latitude, with a late feeding of cane sugar syrup as an insurance against dysentery.

In my first years of beekeeping I built several of those large, clumsy, four-colony winter cases that provided for 10 inches of sawdust packing around the sides of the hives with the usual amount for top and bottom, and I very religiously fed the recommended 10 pounds of cane sugar per colony. The fact that I did not have enough of these cases to pack all my bees caused me to see that such heavy packing was not the proper method of wintering in this region. From necessity, many colonies went through the winter without any protection other than possibly a wrapping of tarpaper. When they were in the proper condition in the fall, they were as good colonies in the spring as those

heavily packed. I have since disposed of all my packing cases and now winter each colony with a shallow super of sawdust on top and one or two wrappings of some kind of waterproof building paper. Bees wintered in this manner will have more flying days during the winter than those heavily packed, as the heavily packed colonies will not feel a change in the outside temperature as quickly as those with less protection, and, therefore, are apt to miss the opportunity when the weather warms up enough for one day to allow a flight.

Of course, wind protection must not be overlooked when using light protection. My apiaries have excellent wind protection, and about 75 per cent of the colonies usually require a third brood chamber about apple blossom time.

It is not necessarily a waste to feed 10 pounds of sugar to assure good wintering if you wish to go to the trouble and expense. I find tulip tree honey a satisfactory winter food for the average winter, but occasionally we do have a severe winter that may confine the bees as long as eight or ten weeks. With such a long confinement, sugar stores probably would be more satisfactory, but I do not recall such a winter since 1918.

In closing, I wish to say a few words in defense of our dark, tulip tree honey. Mr. Marvin is later going to tell you about nectar secretion in the tulip tree blossoms and what a wonderful source of honey this tree is. Many beekeepers would be happier if they were not bothered with tulip tree honey and could produce clover honey instead. It is true that other honeys have a delicate flavor that tulip honey cannot be compared with; also, that tulip honey will not sell upon its appearance; but when you cannot help producing it, you must dispose of it in some manner. It is not a satisfactory honey to put upon store shelves, but sells very well from roadside stands, particularly when the beekeeper can contact the buyer. This honey has a very pleasant twange which makes it ideal for pancakes and waffles. If the beekeeper will emphasize this fact, he will find that one

trial usually results in repeated orders. While the light honeys have the delicate flavors which we all like to offer our trade, I know of none that equals tulip tree honey for the morning pancakes.

A good part of my trade has been built up on tulip honey, and many of my customers take it in preference to any other.

No beekeeper need hesitate to offer it as a table honey when he can deal direct with the customer.

NECTAR SECRETION OF THE TULIP TREE OR YELLOW POPLAR

By GEORGE MARVIN,

U. S. Bee Culture Laboratory.

To one standing near a tulip tree at the height of the blooming period, when a gentle breeze is stirring the branches, the falling of drops of nectar gives the impression of a light rain. During favorable seasons nectar is present in the tulip tree blossoms in such quantities that wild insects and honeybees cannot carry it away as fast as it is secreted; consequently much nectar is lost.

In the vicinity of Somerset, the tulip tree or yellow poplar (Liriodendron tulipifera) blooms the latter part of May, and black locust comes on at approximately the same time. For the last two seasons it has been observed that, when the bees started gathering nectar from the locust, they continued working on it in spite of the preponderance of nectar available from the tulip tree. They, therefore, did not gather a full crop of honey from this tree.

Because of the copious nectar flow from the tulip tree making it an important honey source, and because of its prevalence in the neighborhood of the Bee Culture Laboratory, an experiment was conducted there to find out the

quantity of nectar secreted per blossom and the sugar content of this nectar. Before this experiment is discussed, a brief description will be given of the tulip tree, its flowers, and its botanical range.

BOTANICAL RANGE OF THE TULIP TREE

The botanical range of the tulip tree extends from southern New England and New York westward into southern Michigan and eastern Illinois, southward into southeastern Missouri, eastern Arkansas, northeastern Louisiana to about Baton Rouge, and thence eastward to Jacksonville on the Atlantic coast. The tree is very abundant and is an important honey source in the moist, deep, fertile, well-drained soils of the south-central portion of this range, consisting of Maryland, Virginia, West Virginia, Kentucky, Tennessee, and the western parts of the Carolinas.

This tree is scattered singly or in groups throughout the forest and it is usually associated with chestnut, oak, walnut, hickory, maples, black cherry, locust, and beech.

DESCRIPTION OF TREE AND FLOWER

The tulip tree is a stately tree with a tall trunk and short branches forming a conical head. When mature, the tree is often well above 125 feet in height. The bark is thick, brown, and closely furrowed. The leaves, placed alternate, are 5 to 6 inches long and broad, and are dark in color, shiny above and dull beneath. The buds are long and blunt at the top, the end ones being the largest. The numerous flowers, resemble tulips, having six greenish-yellow petals arranged in two whorls to make a bell-shaped corolla.

Approximately 15 mm. from the base of the petals there is an orange-colored strip 4 to 5 mm. wide, forming a band around the cup. In freshly opened flowers many small droplets of nectar appear on the inner orange-colored surface, indicating that the nectaries are located there. As

these droplets become larger, adhesion not being strong enough to hold them to the petal, they run down and collect in the corolla of the flower.

There are three greenish recurved sepals, so placed and shaped in a freshly opened flower that any nectar running out of the corolla will be caught. After a flower has been open a day, the sepals flex downward.

The flower contains many stamens with large, whitish-yellow anthers. The pistils are numerous, lying one above the other, forming a cone-like spike which, when mature and dry, forms the winged flat seed case.

QUALITY OF HONEY PRODUCED

The honey produced from the nectar of the tulip tree is of a reddish-amber color, is of full, but good, flavor, and is mostly marketed locally. During the last two seasons it was observed that soon after the trees were through blooming the leaves were attacked by an aphid, which secreted large quantities of honeydew. The aphids appear on the young growing tips and, on account of the conical shape of the tree, much of the honeydew is caught on the lower leaves. Numerous blackened, yeast-like forms producing mycelium grow on these leaves, causing them to become discolored and to fall prematurely. If the beekeeper does not remove the surplus honey from the tulip tree soon enough, its quality may be injured by the honeydew.

METHOD OF EXPERIMENTATION

Each evening the large buds which appeared ready to open the following morning were covered with cellophane to exclude bees or other insects and rain. The flowers were tagged as they opened so that their ages were known at all times. After each collection of nectar the cellophane was replaced.

The weight of the nectar in the flowers was obtained by absorbing it in small wads of absorbent cotton. Several hundred wads ½ inch wide, 4 inches long, and ⅜ inch thick were prepared, wrapped in lots of five, and placed in the oven to dry. Each lot was designated by a letter and each wad in a lot was numbered. When the wads were thoroughly dry, they were weighed and then placed in a dessicator until they were used, in order to prevent absorption of moisture from the atmosphere. A wad of cotton was withdrawn from its package with a forceps and packed into the corolla of the flower. With a little practice this could be done without injuring the petals, pistil or anthers. The weight of the nectar was obtained by weighting the wads of cotton with the nectar and subtracting the weight of the cotton.

The nectar for the sugar determinations was gathered from the flowers by means of small glass pipettes. The sugar content was determined by the use of the Abbé refractometer.

RESULTS

Weight of Nectar

For the 32 blossoms under observation, the total weight of nectar secreted per blossom ranged from 0.4748 to 3.1626 grams, the average being 1.6417 grams. Twenty-two of the blossoms opened in the early morning and yielded nectar having an average weight of 1.687 grams, whereas 1.5414 grams was the average total yield for the 10 opening in the afternoon.

Nectar was found in the flower during the first day it was open and the following morning. If this nectar was removed, the blossoms remained practically dry from that time on.

Inasmuch as nectar was present in freshly opened blossoms, 16 large buds that were just unfolding were examined. Quantities of nectar ranging from 0.3466 to 1.5329 grams

were already present, the average weight for the 16 buds being 0.8723 gram. Ten of the buds were opening when the temperature ranged from 82° to 88° F. and the humidity ranged from 60 to 47 per cent. The average weight of nectar secreted by these 10 buds was 0.7619 gram. The other six unfolded while the temperature ranged from 74° to 77° F. and the humidity from 50 to 46 per cent. The average weight of nectar secreted for this group was 1.0563 grams. All these flowers opened in the early morning, but one morning was much warmer than the other. Buds which were large but in which the sepals had not yet begun to loosen were found to be dry of nectar.

Sugar Content of the Nectar

The nectar gathered from freshly opened flowers contained from 15.2 to 19.5 per cent sugar. The uncollected nectar became more concentrated the longer it remained in the open flower and by the second day the nectar had a sugar concentration of 35 to 36 per cent. In a blossom apparently neglected by the bees, nectar was found which had a sugar concentration of 63.9 per cent.

Nectar in freshly opened blossoms is colorless, as the white cotton wads were not discolored. After the nectar had remained for four hours or more in the opened flower it became light yellow.

Calculation of Honey Obtainable From Tree Under Observation.

The tulip tree under observation was 15½ inches in diameter 5 feet above the ground. During the blooming season, from May 16 to June 6, 1932, the limb on which this work was conducted had a total of 108 blossoms and as there were 23 limbs of approximately the same size the tree was calculated to contain a total of 2,484 blossoms. As the average weight of nectar secreted per blossom was 1.6417 grams, it was calculated that 4.1 kg., or 9.02 pounds of nectar were secreted by this tree. Since the average

water content of nectar from freshly opened flowers was found to be 83.3 per cent. and honey is considered to have an average moisture content of 20 per cent. it was calculated that the nectar secreted from this tree would make 2.16 pounds of honey.

REPORT

OF THE

Maryland Vegetable Growers' Association

Fourteenth Annual Meeting

First Session

Wednesday, January 4, 1933

BALTIMORE, MD.

The first session of the fourteenth annual meeting of the Maryland Vegetable Growers' Association was called to order at 10 A. M. by President William N. Eyler at the Lord Baltimore Hotel, Baltimore, Maryland. After a few introductory remarks, President Eyler proceeded with the program by introducing Dr. V. R. Boswell of the United States Department of Agriculture.

RESULTS OF SOME RECENT EXPERIMENTS WITH SWEET POTATOES

By VICTOR R. BOSWELL,

United States Department of Agriculture.

The majority of this audience may surely be considered as more or less expert in the commercial production of potatoes or sweet potatoes, or both. You are already familiar with numerous recommendations of the State Experiment Stations and the United States Department of Agriculture, and doubtless have made trials and observations of your own that have contributed to solutions of many of your

problems. Your speaker is thus led to believe that you may be interested in hearing not only a few recommendations possibly new to you, and a re-emphasis of important old ones, but also a description and discussion of some of the less commonly known events that are intimately associated with the behavior of the sweet potato in the field, in storage and in the plant bed. It is not enough to know merely what to do in general. If we know why specific things should be done, why we obtain certain results from them, it may help us to figure out solutions to other problems. It is reasonable to say that if we know the why of things we are more interested in doing them exactly right, and are better able to exercise sound judgment in applying general recommendations.

It should be understood in the beginning that not all the practices that will be discussed here are to be recommended —far from it. Some evidence will be offered in support of a specific practice, some evidence to show that that or another practice has disadvantages, and cannot be recommended. And, in addition, since you are already so familiar with many aspects of the sweet potato and its culture, the speaker believes that you would like to hear about some of the questions that interest experimental workers. Many such questions are only partly or entirely answered. The experiments designed to give answers may be incomplete and the results inconclusive. We shall be careful to distinguish between the certain and the uncertain results. Even though not conclusive, some of the experiments will interest you because of the new problems and questions that they bring to mind. These matters will be discussed under the general topics with which they are closely related, such as storage, propagation and fertilizer practice.

STORAGE

You know that it is impossible to harvest sweet potatoes without wounding them. Even if none should be cut by the plow nor later bruised in handling, there would still

be at least one wound on each root where the attachment to the stem is broken, and frequently another where a small root is broken off. Every wound is a possible entrance for storage rots, and, as a matter of fact, storage rots rarely attack a sweet potato *under good storage conditions* except through a wound. (Conditions conducive to infection in the absence of wounds will be discussed later.) All that has been said concerning the great importance of avoiding even slight bruises and wounds cannot be over-emphasized. In spite of all care, however wounds occur during harvest. What can be done about it? The first thing is to put no badly wounded potatoes into storage. What then, happens to the slightly wounded material? What happens when a man or animal receives a slight wound? If it is properly cared for, new cells are produced that soon close it or heal it over, thus closing the easy entrance to infectious germs. If the wounded sweet potato is properly cared for, there is a very good chance that its wounds will heal over, closing the entrance to storage diseases before any of the disease organisms become established on the wounded surface.

Artschwager and Starrett in the Bureau of Plant Industry, as well as other workers, have shown that there are two quite different and distinct phases to this healing process, and they are greatly influenced by the storage conditions. The skin of the sweet potato is a thin layer of dry thin-walled cells of a somewhat corky nature which, although quite thin, are remarkably resistant to loss of water from the root and resistant to the entrance of decay organisms. For some distance beneath the skin the root contains chiefly large, delicate, thin-walled cells that are filled with starch grains and other food materials that are ideal for rot organisms to grow upon. Now, what happens when the skin is broken and the naked cells below are exposed? Yes, a milky fluid may be exuded and this soon dries down. But don't think that wound is really healed. Our own wounds are not healed as quickly as blood ceases to flow. There is still danger of infection. Even though a fresh

wound on a sweet potato may appear well hardened down, rot infection may occur unless it is actually healed beneath. The first step in the healing process is a chemical change in the walls of the cells that have been exposed by the wounds. The walls of just a few layers of cells become heavy and impervious, and help to prevent loss of moisture, or entrance of disease germs, but this blocking off of the exposed cells is only temporary. Under proper storage conditions it is followed by the production and growth of actually new cells just beneath the outer layer that has become rather tough and impervious. These new cells form a layer several cells thick that is called wound-cork. The outer cells of the layer finally develop a cork-like nature somewhat similar to the original skin of the potato, thus permanently and effectively healing the wound.

Why have we gone into detail in describing wound-cork formation? And what bearing do storage practices have upon its development? Can it be controlled? Fortunately, the process may be very greatly facilitated by supplying proper conditions of humidity and temperature. The roots should, of course, be placed under these conditions as soon as practicable after harvest because we want the healing to occur as quickly as possible.

How long is required for wound-cork formation? That depends on temperature and humidity; and that is one of the reasons why proper storage-house management is so very important during the curing period. Low temperature or dry air prevents healing. At a temperature of 53 degrees F. or below, not even a trace of the first stage of blocking off the wound occurred in 10 or 11 days, but at about 54 degrees it started after about six days if the air was sufficiently moist—a relative humidity of about 95 per cent. At about 60 degrees it was first evident in four or five days; at 72 degrees it started after two days, and at 83 degrees it required but one day. Even if the temperature is as high as 83 degrees to 85 degrees, it will not occur for five or six days if the air is as dry as 65 per cent relative

humidity, but proceeds rapidly if it is as moist as 75 per cent relative humidity or above.

When sweet potatoes are first put into storage they give off considerable water; consequently it is necessary to furnish good ventilation and usually heat to prevent the condensation of moisture on the roots and on the inside walls of the house. This being the case, it is hardly probable that too low humidity will cause trouble after the sweet potatoes are put inside. But remember the temperature effect—it is quite important.

The formation of the new true cork layer depends on much the same conditions as the temporary blocking of cell walls just described, but this latter process does not start until after the other. Temperatures or humidities that delay the first delay the second still more. Indeed, the true cork cells may not start to form for more than ten days, even though the temporary blocking started in three to four days at low humidity (75 per cent) and the moderate temperature of 75 degrees. Likewise it may be delayed at humidities as high as 92 or 93 per cent if the temperature is as low as 65 degrees. No one would think of attempting to cure potatoes at such a low temperature, but this shows the importance of getting the stock into the house and getting the fire started promptly. No healing occurs at low temperature or in dry air. The chances of infection under such conditions are, of course, increased. At temperatures close to 85 degrees with a high humidity (about 90 per cent) the most rapid wound-cork formation takes place, beginning by the second day, which is just a day later than the temporary cell blocking started. This maximum speed of development is what we want to insure in our treatment of the harvested crop. Note that the maximum rate of cork formation occurs at 85 degrees, the temperature that all of you know has been widely recommended for years as the best curing temperature. We have known for many years that that curing temperature gives the results we want with reference to reducing storage losses

from decay, but only recently have we been able to understand exactly certain of the reasons why. This little story may not be the whole story, but it is certainly a large part of it. Harter and Weimer and other workers have shown quite definitely that the chances of infection of sweet potatoes with storage rot are very largely dependent on the presence or absence of the wound-cork layer and on the temperatures that delay or promote wound-cork formation.

During the curing and storage periods there are two sources of loss in weight aside from such discards that might be necessary on account of disease. You have heard and read a good deal about the loss of water, but the Alabama Agricultural Experiment Station has shown that some solid matter is actually lost also. The loss in weight during the curing period is usually 6 to 8 per cent, most of which is water. Does this mean that the water content in per cent decreases that much? If that much of the water were removed from a sweet potato we might expect the flesh to be far less moist than at first. When eaten, such potatoes are not noticeably dryer, even if baked. It may surprise some of you to know that if an accurate determination of the content of water in such a cured potato is made, the percentage is almost the same as before curing, only about 1 per cent less. How then can 6 to 8 per cent loss of weight (mostly water) occur with such a slight change in the moisture content of the root? Most of us have probably thought of the curing process largely as one of drying down the potatoes a little, or as it is usually stated, getting rid of excess water; but the percentage of water is still nearly the same as before curing. The roots can hardly be said to have been dried down.

Of this 6 or 8 per cent curing loss, about 1 per cent represents lost solid material. Removing some dry matter at the same time that water is lost, of course, tends to keep the proportions of the two things more nearly alike. There is another thing though in connection with this loss of dry matter that helps to hold up the water content of the root.

In the Alabama experiments referred to it was shown that the 1 per cent of dry weight that was lost was lost by respiration. Respiration in this sense does not mean breathing as we usually think of it, but refers to the process that we might call a burning of fuel or stored foods, for furnishing energy necessary to keep the root alive. When a substance is burned, what else is given off besides energy? We can consider an example familiar to many of you. If you burn a small gas or oil stove or heater with no flue connection, in a closed room on a cold day, you know that droplets of water soon appear on the windows on the inside. You also know that using a stove with no flue connection is dangerous because of the poisonous products formed by the gas flame. Carbon dioxide, and usually carbon monoxide, and water are produced by the burning gas. The water that condenses on the windows came from the burning gas and the oxygen of the air. Other fuels produce heat or energy, carbon dioxide and water when burned. Foods or stored fuel utilized by plants and animals give off energy, carbon dioxide and water as they are "burned" in the animal body or plant. In the instance of plant organs the water may not escape readily from the tissues, thus remaining to replace a part of that lost by evaporation. If it were not for this formation of what is called water of respiration and the loss of dry matter from which part of this water is derived, the curing process would be much more of a drying-out than it really is. If we have been accustomed to think of the curing period simply as a drying period, we should change our view somewhat. The change in percentage water content of the sweet potato during curing is one of the lesser changes that occurs.

About ten years ago were published results of some very interesting studies relating to differences in the properties of a number of sweet potato varieties before and after curing. This work by Magoon and Culpepper in the United States Department of Agriculture showed very strikingly that the curing process involves some very important internal changes, emphasizing again that it is far more than a

process of removing excess water. These studies showed after curing roots for ten days at 85 degrees F. a loss in moisture of approximately 1 per cent, the same as later found in Alabama in a quite different study. But despite this slight loss in moisture content, the flesh was much softer and "juicier" when cooked than that of potatoes cooked before curing. How can that be possible? We have been accustomed to thinking of curing as a water removal process, we know the roots lose 6 to 8 per cent of their weight, most of which is water, and still the flesh is apparently more moist than before. Another thing they found that appears just the reverse of what one might expect was that a so-called dry-fleshed variety like Yellow Jersey actually contained more water than so-called moist-fleshed varieties like Puerto Rico and Nancy Hall. What then is responsible for this softness and apparent moistness? It is not the amount of water in proportion to the other substances that make up the potato, but mainly the character or the nature of these other substances.

There is a difference in the nature of the stored foods in the moist and dry sorts. The Yellow Jersey, for example, has a higher starch content than the moist type. The moist type contains an abundance of stored food, but it is partly in the form of dextrin, which results in a much less firm structure than starch when cooked. The more starchy potato stands up, the other goes soft, even though the soft one contains less water than the other.

Returning to our discussion of changes during curing, the softness and juiceness of sweet potatoes after curing is evidently due to the same thing that causes Nancy Halls to be softer and more juicy than Yellow Jerseys. During curing part of the starch in dry-fleshed sorts like Yellow Jersey is changed into other substances, principally dextrin and sugar. This causes even the dry-fleshed type to become softer, apparently less dry, and more palatable. The Puerto Rico and Nancy Hall are less starchy and sweeter before curing than the dry-fleshed type, and during the curing

process undergo a considerably greater change. In fact, practically all the starch becomes changed into dextrin and sugar so that upon cooking we have a very soft, very juicy product.

All these remarks may be a little confusing. Sweet potatoes lose considerable amounts of moisture during curing, but are dried out very little thereby. Even though dried out a little they appear more soft and moist upon cooking than they did if cooked before curing. What we call dry-fleshed varieties contain more water than moist-fleshed ones. Just remember that the curing process is primarily for promoting the healing of wounds and the occurrence of possibly other surface changes that improve keeping quality. At the same time we provide adequate ventilation to remove water that is lost from the roots before these changes are complete. And remember, too, that the softness of a sweet potato is no index to the amount of water it contains. Softness is determined by the nature of substances other than water.

These facts will explain at least partly, why sweet potatoes cured at the proper temperature keep better and taste better than those not so treated. They also explain why some varieties yield a product too soft for a first-class canned product after curing, while others are sufficiently firm.

Some growers and experimenters have thought that 85 degrees is higher than necessary for curing, and have objected that it causes excessive loss of weight during the curing process. It also may be a little more costly, since more fuel is required for heating the house. It has been argued that 75 degrees would permit the potatoes to "dry down" satisfactorily and would avoid excessive shrinkage during curing. Mr. J. H. Beattie of the Department of Agriculture has been studying this question for some years. After learning about the effect of temperature upon healing, you may be able to predict the results of curing at 75 degrees and 85 degrees. Let us see if you are right.

Without going into the entire series of tests made on different varieties a partial summary of the results to date will indicate what has happened. The sweet potatoes were placed soon after harvest in the type of storage house recommended by the Department of Agriculture and the experiment stations. One room was maintained as near 75 degrees as possible, and the other at or near 85 degrees for nine to ten days. Those cured at the higher temperature lost generally about 7½ to 9½ per cent of their original weight, while the other lost about 6 to 8 per cent—really a very small difference. Sometimes the 85-degree lots would lose as much as 3 per cent more than the 75-degree lots, but other times the difference was only 1 per cent and even less. Always, however, as one would expect, the 85-degree lots lost a little more weight than the others. Loss from rotting was not a factor during these curing periods.

What about the losses while stored at the same temperature of 55 degrees after different lots have been cured at these different temperatures? In so far as total shrinkage is concerned, including discarded rotten roots, the potatoes cured at 75 degrees usually lose more weight than those cured at 85 degrees, but when we add together the losses of both the curing and the storage periods, the total loss in weight for each of the two differently cured lots is practically the same under well-managed storage conditions. Under poor storage conditions we would expect the 75-degree cured lot to lose considerably more weight than the other. Loss in weight, however, is not the only measure of successful storage. Thus the lower curing temperature has not resulted in a smaller percentage of loss as has been argued for it, so it is of no advantage. Besides the greater loss from rot it resulted in one other rather striking difference. Low temperature curing was followed by more apparent shriveling and the development of many unattractive-appearing specimens. If all the off-grade specimens were discarded, those with more or less rot damage or otherwise ugly surfaces, the 75-degree cured lots were definitely in-

ferior. Remember that wound-cork forms best at about 85 degrees and that the pathologists have actually demonstrated the effectiveness of this layer in retarding and preventing infection by certain rots. On the basis of all this evidence there should be little question about the desirability of curing at 80 degrees to 85 degrees instead of 75 degrees. Even so, another season or two of practical curing tests will be carried through in order to more definitely settle the matter.

Now let us consider some of the effects of different storage temperatures after the potatoes are thoroughly cured at 85 degrees. We are all familiar with the recommendation that the temperature should be kept between 50 degrees and 55 degrees. Many vegetables can be stored at a temperature near the freezing point of water, 32 degrees F., without injury, and indeed to best advantage. Sweet potatoes cannot be so stored. Suppose the temperature drops to 40 degrees in a part of the house that is difficult to heat. There are two evil effects of that low temperature, even though it is more than 10 degrees above the freezing point of the potatoes. (They freeze at about 29 degrees F.)

The first thing that happens to sweet potatoes that are chilled, but not frozen, is an increase in their susceptibility to infection by certain rots. Studies by Lauritzen in the Department of Agriculture show that even when the relative humidity is kept between 70 and 80 per cent apparently sound roots become infected and rot. Exposure to 40 degrees for three weeks or less resulted in no evident injury two months after they were returned to the recommended storage temperature, but if kept at 40 degrees for more than three weeks, 40 to 90 per cent of them rotted. The higher the humidity during the chilling period, the greater is the damage. Under practical storage conditions the humidity would most probably run high during such a chilling period and thus the greater damage would be expected. In some cases chilling at 40 degrees for only two weeks caused 10 per cent of rot. Most of the damage

became evident several weeks after the proper temperature had been restored, only about a third of it showing up at the end of the chilling period. It was not possible to prevent infection at 40 degrees even by lowering the humidity to 62 per cent. Chilling just above 32 degrees was much more injurious than at 40 degrees.

These chilling temperatures evidently produce some change in the root that lowers its resistance to the invasion of the rot organisms. This view is strengthened by the occurrence of a kind of internal breakdown, even in some of those roots not attacked by disease. These damaged areas usually were brown in color and existed as small patches close to the bundles of fibrous tissues near the outside of the root. It requires severe chilling near the freezing point to cause this internal breakdown to develop within a period of a few weeks. Most of it, like the infection with rot, shows up a month or two afterward.

Another evidence of injury to roots chilled between 32 degrees and 40 degrees is the loss of capacity to produce sprouts. In connection with these same experiments on chilling by Dr. Lauritzen, it was found that a few of the roots chilled at 40 degrees for periods of two to five weeks would produce no sprouts when bedded. Unfortunately, we do not have information upon the number and size of sprouts produced by those roots that did grow after chilling. Even though most of the roots produced sprouts, the fact that some roots produced none, leads us to expect that some degree of injury occurred among those that did grow. At how low a temperature and for how long can sweet potatoes be held before their value as bedding stock is impaired? We ought to know. Mishaps and storage mismanagement occur often enough to make it worth knowing.

FERTILIZER

Making fertilizer recommendations for one locality upon results obtained in a different region is rather hazardous. Such recommendations may be all right, but are too often

wrong. With reference to sweet potato fertilizers, however, the experimental and practical results obtained in many different regions are in remarkable general agreement. This may be due in part to the fact that most of the principal sweet potato growing regions are characterized by soils of the lighter types that are not widely different from each other. In the Eastern and Southeastern States fertilizers low in nitrogen, medium in phosphorus and high in potash are generally used, the analyses varying from 2 to 4 per cent nitrogen, 4 to 8 per cent phosphorus and 8 to 10 per cent potash. A 2-8-10 is a very popular mixture in the Atlantic Coastal Plain area, but many experiments cast some doubt on the real need for as much as 8 per cent phosphorus. There is no question in this region as to the need for fairly large amounts of potash, and a little nitrogen and phosphorus; but the requirements are not so clear in all parts of the country. The speaker well recalls assisting in the harvesting of sweet potato fertilizer experiment plots at the Missouri Experiment Station near Columbia some twelve or thirteen years ago, where it was still a question as to whether any fertilizer at all would pay. Under the conditions of those particular experiments it didn't pay. But all of you know that it would be futile to attempt to grow sweet potatoes in this State without a generous use of fertilizer. The questions are how much and what kind to use. It is unnecessary to go into great detail on this matter here because the results of studies by your own experiment station in your own sweet potato growing areas are available to you in Maryland Agricultural Experiment Station Bulletin 311, "Fertilizer Studies and the Production of Sweet Potatoes." It might be well, however, to mention briefly the outstanding features of that work.

Studies in Wicomico and in Prince George's counties are in very good agreement. The most striking result was an increase of 50 to 75 per cent and in a few cases as much as 400 per cent from 200 pounds of muriate of potash alone. The total yield from six different experiments over a period

of five years was 76 per cent greater for the potash than for the untreated plots. In some places 200 pounds of potash meant the difference between no crop and a fair crop.

Six hundred pounds of superphosphate per acre was of far less benefit than 200 pounds of potash. Whereas potash gave a 76 per cent increase, superphosphate gave only 30 per cent. Extra nitrogen alone, in the form of 87 pounds of nitrate of soda plus 200 pounds of dried blood was apparently of no profit whatever, since it increased yields only about 6 per cent. That certainly would not pay for the fertilizer. When 1,000 pounds of complete fertilizer was used, one made up of nitrate of soda, dried blood, superphosphate and muriate of potash analyzing approximately 3-10-10, the yields were hardly any better than with 200 pounds of potash.

What should be recommended on the basis of these results? In these days of low prices and narrow margins of profit it is essential to reduce operating costs to the lowest point compatible with good land management and to consider increased yields on the basis of dollars returned for a dollar spent. It is obvious that the amounts of nitrogen and phosphoric acid applied to sweet potatoes in these experiments resulted in loss of money.

Recent experiments of the North Carolina Experiment Station and the Bureau of Chemistry and Soils in North Carolina show no appreciable increases in yield from more than 4 per cent phosphoric acid in fertilizer for sweet potatoes, and there may be a question whether those increases are profitable.

The superphosphate added to sweet potatoes is doubtless of some value to crops that follow, and so its inclusion in the fertilizer may be justified on that account. It would so much on sweet potatoes, a year or more in advance of seem better practice, however, to apply more of it directly to other crops, to crops that do respond instead of putting

those other crops. In this State a 2-8-10 mixture is very commonly recommended and used, but it appears that if a field produces satisfactory yields of other crops, it would be more profitable to apply only potash to the sweet potato crop, for the time being, at least.

About ten years ago the New Jersey Agricultural Experiment Station first published reports upon the effect of potash upon the shape of the Yellow Jersey type of sweet potato. Complete fertilizers were applied at the rate of 1,200 pounds per acre. As the per cent of potash increased from none up to about 10 per cent, the individual roots became both actually and proportionally greater in diameter, or "chunkier" in appearance. Many thousand measurements were taken to determine the reality of this apparent difference in shape, and the results are quite striking. The speaker assisted with fertilizer experiments on Yellow Jerseys while at the Maryland Experiment Station some years ago, in which it was easy to see that the roots from low potash or no potash plots were small, slender, spindle-shaped, and poorly developed. The yields on such plots were very low, the roots plainly failing to enlarge. There was a large proportion of No. 2's and "strings." Although no measurements of the roots were made, there is little doubt that results in Maryland would agree with those in New Jersey.

Nevertheless, a number of workers have believed that there has been a tendency to interpret the New Jersey results too broadly, a danger of concluding simply that high potash will make thicker, chunkier roots. Not only may the soil be a factor, but also varieties may differ in their response to potash. In the South the most important variety is the Puerto Rico, a variety normally chunky, thick and often with some roots bulbous in shape in contrast to the more typically spindle shape of the Yellow Jersey and related sorts. Co-operative experiments in progress at Florence, South Carolina, by the Bureau of Plant Industry, and the South Carolina Experiment Station, offered a

chance to check up on this matter. The diameter and the length of each root of the entire yield from plots receiving 3-8-3 and 3-8-15 treatments have been measured in each of three years, and the treatments were repeated four times each year, thus giving a total of twelve comparisons. The crop from each plot was separated into Jumbos, No. 1's and No. 2's before measuring. A total of 48 comparisons was thus worked out, including separate grades, and total yields for each year.

In 17 out of 48 cases there was no difference in shape that could be ascribed to the treatments. In 16 cases the high potash plots yielded roots significantly thicker in proportion to length, and in the remaining 15 comparisons the roots from the high potash plots were significantly less thick in proportion to length. If we consider the shapes for the total crop of 1929 and of 1930, the high potash material was ever so slightly more slender in proportion to length. Although the figures are entirely reliable and we can depend on them, the difference is so small as to be of no importance whatever from a practical standpoint. In 1931 the results were reversed. Figures for individual grades and for single plots as well as for the total crop showed the high potash roots to be rather markedly thicker in proportion to length than the others.

The baffling thing about the situation is that these shape differences are not correlated with yield, with percentage of different grades, or with anything else that we know about. In some instances the higher yielding plots produced chunkier potatoes, in some instances the reverse, and again there was no difference. All that we can say about this matter at present is that under some conditions and with some varieties the higher potash plots yield the chunkier roots, but that under other conditions there may be no difference or even an opposite difference. Some factor besides potash evidently plays a large part in determining shape in some places. We don't know what that is, but

we do know that we cannot draw the general conclusion that high potash will always improve the shape.

We must be careful in discussing this matter not to confuse size with shape. What happens to size is a quite different story. For example, in these studies just described, the high potash treatments consistently produced a higher percentage of No. 1's and Jumbos, therefore larger roots, than the low potash plots. The differences were small in 1929 and 1930, but rather pronounced in 1931.

When large quantities of fertilizer are used on light soils, 1,000 to 1,500 pounds per acre, care must be taken to avoid injuring the plants. The Bureau of Chemistry and Soils of the Department of Agriculture and the North Carolina Agricultural Experiment Station have recently prepared a report of some co-operative work on this problem. The results will soon appear as United States Department of Agriculture Technical Bulletin 335. By courtesy of Dr. J. J. Skinner of the Bureau of Chemistry and Soils, we have these results available before publication.

The most common practice in applying fertilizer to sweet potatoes has been to open a furrow where the row is to be, distribute the fertilizer in the furrow, mix it more or less with the soil, then merely close the furrow or turn up a ridge, whichever happens to be the local practice. It has been assumed that this procedure puts the fertilizer in a position where the roots of the young plants can reach it soon after they are transplanted, at the same time removing it far enough and mixing with soil so that no injury results. The results of the co-operative work just mentioned indicate rather definitely that this method of putting down fertilizer often causes considerable injury. Injury is particularly marked when fertilizer containing large quantities of very soluble materials is used. It was found in two years' work that applying the fertilizer as a side dressing three weeks after the plants were set did not cause any reduction in stand by injury to the plants. On the other hand, with the

old common method described before, stands were damaged anywhere from a few per cent up to 90 per cent. This latter figure is extreme, of course, but is an interesting example of what may happen. The same fertilizer mixture (1,600 pounds per acre of 4-8-8) that caused 90 per cent injury when put in the ridge caused no loss of plants when applied as a side or top dressing three weeks after setting the plants. The injury was greater when the ridge was formed over the fertilizer without mixing with the soil than when it was mixed.

You may reply to these statements by saying, "Of course one won't cause as much damage by putting fertilizer on top of the ground after setting as by putting it near the roots; but neither will the plants have easy access to the fertilizer. Unless a great number of plants are killed, the old method of application would still seem to have advantages." After all, the yields from these different methods are the important thing. Despite the practically perfect stand of plants on the top dressed and side dressed plots, the yields were not significantly higher than those treated by putting half the fertilizer (500 or 800 pounds) in the row, mixing thoroughly, turning up the ridge, and applying the other half as a side dressing three weeks after the plants were set. Even though 10 to 25 per cent of injury was produced in certain plots where half the fertilizer was put under the row before planting, the final yields of those plots were not materially different from those having perfect stands. There is evidently danger of reducing stand to such a point that yields will be lowered by putting more than 700 or 800 pounds per acre under the ridge before planting on light soils. Any amount to be applied in addition to 700 to 800 pounds can more safely be applied as a side dressing about three weeks later and cultivated in.

In an effort to confirm the evidence that the injury just described was due to too much fertilizer close to the plants, soil was taken from near the roots of the young plants and the amount of soluble salts of all kinds measured. As was

expected, the amount of plant injury was very closely related to the amount of fertilizer salts in the solution in the soil. One of the striking things in this connection was the very harmful effect of kainit when applied under the row in large quantities. Far more injury occurred where kainit was used than where muriate or sulphate of potash was used as the source of potash. We must not conclude from this that kainit is more injurious, pound for pound, than the other materials, because the experiment does not show that to be true. You may remember, however, that kainit contains only about 12 per cent of potash, while muriate and sulphate of potash contain about 50 per cent. This means that in applying equivalent amounts of actual potash about four times as much kainit will be needed as of the other constituents. In these particular mixtures, for example, where 250 pounds of muriate per acre was included in a mixture, it would require 1,000 of kainit to furnish the same amount of potash. Besides the potash salts, kainit contains great quantities of readily soluble salts such as magnesium sulphate, or Epsom salt. Thus you see that heavy applications of kainit supply great quantities of soluble materials that presumably do the plant no particular good in any amount, and the amount of material in itself is harmful because of its great concentration. The main points in these studies to remember are that for applications of more than a few hundred pounds of fertilizer per acre kainit is likely to be inferior to either muriate or sulphate of potash as a source of potash in the mixture; and that no more than 700 to 800 pounds of any of the ordinary mixtures should be applied under the ridge before planting. The remainder of the amount to be used should be worked in as a side dressing about two or three weeks after planting.

PROPAGATION

Extensive studies with Irish potatoes have been made for many years relative to the best methods of propagating that plant, and the handling of planting stock. Aside from

studies designed for the solution of disease problems, practically nothing has been done with sweet potatoes. We are familiar with reasonably successful methods of plant production, but there may be much better methods. We know that storage conditions and periods satisfactory for Irish potato table stock are not always suitable for seed stock, but we know very little about the effect of storage periods and temperatures upon sweet potato seed stock. Much time has been devoted to studying number and size of plants produced by Irish potatoes treated in different ways, but a beginning has hardly been made with sweet potatoes. You may say that you aren't interested in producing more sweet-potatoes, but only better ones. You are interested, however, in producing what you need at the lowest possible cost and with the least trouble. Construction and operation of hot-beds and carrying large quantities of seed stock through storage are expensive. Is there anything practical, not in current practice, that can be done to increase the yield of good plants obtained from a bushel of stock? Can we produce more vigorous plants so that there will be fewer missing hills? Why are some varieties strong sprout producers, and some weak? There are plenty of questions, but few answers.

Mr. R. C. Thompson and Mr. J. H. Beattie of the Division of Horticultural Crops and Diseases have been making some very interesting studies the past three years relative to the amount and character of sprouts produced on Puerto Rico roots of different size and which were subjected to certain treatments. You know, of course, that a bushel of medium or small roots will produce a greater number of sprouts than a bushel of large roots. Are these sprouts from small roots as large and as good individually as the fewer sprouts from large potatoes? The results of these workers show in general a remarkably constant relation between weight of roots bedded and weight of sprouts produced. Thus if we get more sprouts from a bushel of small

roots the sprouts will be smaller, granting, of course, that other conditions are the same.

These men had noticed, as you may have noticed, that most of the sprouts arising from a root are usually more or less bunched together and crowded near one end of the root. And that end is the end by which it was connected with the plant. This is just opposite to the position from which most of the sprouts arise from a normal Irish potato tuber. Does this crowding of sprouts cause them to be more spindling and less desirable for transplanting than if they arose at well-spaced intervals over the entire length of the root so as to have more space in which to develop? In an effort to cause the sprouts to arise along the whole length of the root instead of in a bunch at the stem end, several different treatments were given.

Several lots of roots were treated by cutting off about an inch of the stem end, these separate tests being made at different times during the winter and spring, and in different years. In about half of these trials removing the stem end resulted in sprouting all along the root. In other tests this result was not obtained. In those cases in which the sprouts were well distributed over the root the size of the individual sprout was slightly greater than if the sprouts were crowded.

The purpose in referring to these results is to illustrate another of the lines of work in progress on this crop. No conclusions can as yet be drawn, so, of course, no recommendations are being made. There are disadvantages to be overcome, such as the danger of rotting in the plant bed as a result of exposing freshly cut surfaces. However, further studies are to be made to determine if there are practical possibilities of increasing sprout vigor and yield of sprouts per bushel of seed stock as a means of reducing the cost of producing plants of this crop.

THE JERSEY QUEEN CABBAGE

By J. C. WALKER.

(U. S. Department of Agriculture and University of Wisconsin.)

Cabbage yellows is a common and destructive disease of cabbage in the United States. It reaches its maximum importance in those regions where the peak of the soil temperature is reached soon after the plants are set into the field. Thus we find it most destructive in the Central States, particularly in Ohio, Indiana, Iowa, and southern Wisconsin. Where these favorable temperatures do not occur ordinarily until the latter part of the growing season for cabbage it appears as an end-season disease. This is the situation usually found in the Southern States, where the main crop is a winter crop and a similar condition prevails in the Baltimore section. Depending upon the timeliness of the warm weather in May, the crop may in some seasons escape severe damage while in other seasons the disease may be very severe.

The causal fungus is a species of Fusarium (*F. conglutinans Wr.*) which also attacks cauliflower, kale, kohlrabi, and Brussels sprouts. It remains indefinitely in the soil and increases rather than subsides from year to year. Thus it does not yield to soil treatment nor to crop rotation. The only successful method of control is through the development of resistant varieties.

Practically all varieties of cabbage in use in this country twenty years ago were very susceptible to yellows but all contained a small percentage of individuals which remained healthy on very "sick" soil. Such individuals became the basis of new strains which have been developed so as to contain high percentages of resistant plants. A number of commercially succesful mid-season and late varieties have been produced and are now in general use. The latest development is a selection from Jersey Wakefield variety

which is now coming into use. It has been named Jersey Queen to distinguish it from the mother variety. The history of its development will be briefly discussed.

Jersey Wakefield was planted on thoroughly infested yellows-sick soil in 1925. About 18 per cent survived the season without signs of the disease. This group comprised 60 plants. Many of them were not of good type. About 35 plants were saved and planted in the greenhouse. Thirteen of these produced seed by self pollination. Some crosses between paired plants were made. In 1926 these progenies were again tested upon sick soil. All showed some diseased plants, the percentages varying from 10 to 35 per cent. Altogether there were 2,145 plants of which almost exactly 25 per cent were diseased. The various lots differed widely as to type. In some, many plants were off-color, in others they were too leafy, or too late in maturity, while in others the head shape was not typical. The progenies from all but six plants were completely discarded and rigid selection was made in the remaining lots. There were again taken to the greenhouse and the plants again selfed and some were intercrossed. In 1927 six self progenies were completely resistant and the rest showed around 25 per cent susceptible plants. Four of the completely resistant selfed progenies were discarded. Selections were made from the two remaining lots and also from two hybrid progenies where the parents had yielded completely resistant progenies upon selfing. Selfing was now discontinued since when repeated generation after generation it tends to reduce vigor. The plants were allowed to cross and when the seed was again planted on sick soil it remained completely resistant. This thoroughly tested and highly resistant stock was planted for increase in 1932 and should yield a seed crop in 1933.

In the meantime some of the heads selected from the first trials of 1926 were grown and allowed to intercross. This lot showed only 15 per cent yellows and was planted for seed increase in 1930. The crop of seed matured in 1931 and was released as a preliminary strain in 1932. When tested

on sick soil in 1932 it again showed only 15 per cent yellows where commercial varieties showed 90 to 100 per cent yellows. This partially resistant line will be replaced by the completely resistant line in 1934.

During the development of this variety every effort was exerted not only to attain complete resistance but to hold as closely as possible to ideal Jersey Wakefield type. In 1930 the increased lot of the completely resistant seed later used for multiplication was tested on yellows-free soil alongside of four commercial lots of Jersey Wakefield. It was found to come within the range represented in these lots at to time of maturity, yield, head shape, core length, and ratio of outer leaf weight to head weight. It is therefore believed to represent an acceptable Jersey Wakefield type and to carry the added quality of high resistance to yellows. It is named Jersey Queen to distinguish it from ordinary Jersey Wakefield.

THE MARYLAND ALASKA PEA

By C. E. TEMPLE,

University of Maryland.

The investigations which have resulted in the development of the Maryland Alaska variety and certain other wilt-resistant peas in Maryland began in 1918. Prior to that time canners, county agents and others had noticed the diseased condition of pea fields from time to time, and had sent specimens of diseased plants to the Extension Service and to the Experiment Station in an effort to find out what was causing the disease and what could be done to control it. In the spring of 1918 the diseases of peas attracted so much attention that the Director of the Extension Service, Dr. Thomas B. Symons, authorized a survey of the pea fields of the State to determine, if possible, what was causing the failure of the pea crop, and to see if anything could be done to reduce the losses from disease in the future.

During the survey that followed canning, market, and garden peas in several counties were examined for diseases. The amount of disease found revealed for the first time the serious condition of the pea crop in the State. Diseases were found in nearly every planting examined. In some cases the growth had been checked, the leaves had turned pale, and had begun to wither, and some plants had died. This diseased condition prevailed in spots of varying sizes up to several rods in diameter. An occasional field was found that produced no peas at all. These extreme losses were never found except where many crops of peas had been grown. In one field where the crop failed peas had been grown eight years in succession. The average loss for the State was estimated at 15 per cent of the crop.

Root diseases attracted more attention than blight and other leaf and stem diseases, and they seemed to be causing the principal losses. In some cases the outer portion of the main root would slip off when the plant was pulled; in other cases, the outer portion remained intact when the plant was pulled, but the central portion was more or less discolored. Then, too, it was noticed that the leaves and stems of the diseased plants did not always respond in the same way. However, when specimens of the diseased plants were submitted to Dr. W. A. Orton, Chief of the Office of Cotton, Truck and Forage Crop Diseases, United States Department of Agriculture, he pronounced them "Root-Rot" for want of a better name. Dr. Orton manifested considerable interest in the specimens, especially in those having vascular discoloration. This appears to be the beginning of the interest taken in this country in the recent investigation of the root diseases of peas. It marked the beginning of the disease resistance work in peas in Maryland, and it may have something to do with the fact that Dr. Orton assigned certain assistants to the pea disease problem; and it was prior to the time the workers in Wisconsin began their investigations of the diseases of peas.

In Maryland individual healthy plants were selected

from badly diseased fields and from diseased spots in otherwise healthy fields. Arrangements were also made with growers to leave certain diseased areas unharvested. These were visited later for the purpose of making still more selections. In one field the healthy plants were staked and each selected plant was tied to a stake and allowed to ripen before it was harvested. In all, 417 selections were made in the spring of 1918.

It may be of interest to note what happened to these 417 selections of 1918. The seed of these selections was planted in 1919 on land that failed to produce peas in 1918. Six of the lots failed to come up, having been harvested too young, and eighteen were destroyed by vehicles driving over the plots. Of the others, 118 lots amounting to about 2,000 plants were all killed by root diseases. This puts 142 selections out of the picture. The remaining 275 selections produced about 3,000 plants, however, only 818 plants reached maturity; the others were killed by root diseases. Only 98 plants were free from root diseases. Those 98 plants either had escaped root diseases or they were more or less resistant to them.

It is now known from later tests here and investigations elsewhere that at least two root diseases were common in the pea fields—Aphanomyces root rot and Fusarium wilt; and, that wilt was responsible for the premature death of the plants in the fields and in the test plots.

The elimination test in 1919 reduced the number of selections or strains from 418 to 14. The 14 survivors together with other new selections made in 1919 were given the elimination test for the next five years on the same infested land. This land was furnished by Wrightson and Son at Easton. Out of this work came two strains of the Alaska variety that were resistant to wilt. One of these has been multiplied and given the name, Maryland Alaska.

Maryland Alaska appears to be a promising pea. In addition to its being resistant to the Fusarium wilt, it is uniform

in growth and in maturity and it is prolific. In all tests made thus far, both in small plots and in acre plots with viner weights, Maryland Alaska has given greatly increased yields over commercial Alaska and somewhat increased yields over other wilt resistant varieties of the Alaska type. This point is illustrated very well by the following data obtained by H. A. Hunter and T. D. Holder, both of the University of Maryland and specialists in canning crops.

In 1931 Maryland Alaska was compared to commercial Alaska, a variety susceptible to wilt. In this case Maryland Alaska gave an increase in yield of 8.84 per cent over the other variety. The following year, these workers compared four varieties of the Alaska type on each of two farms in Carroll County. In this case one acre plots were used for each variety on each farm. Records were obtained from an equal number of yard-square plots harvested from each one-acre plot, and also from the entire acre plots. The peas from the small plots were picked and shelled by hand so that accurate weights could be obtained. The peas from the acre plots were harvested in the usual way and shelled with the viner so that viner weights of shelled peas could be obtained. These results are given in the tables.

COMPARISON OF MARYLAND ALASKA WITH OTHER VARIETIES IN YIELDS OF SHELLED PEAS PER ACRE, INCLUDING THE AVERAGE YIELDS OF COMPARABLE PLOTS ON TWO FARMS.

	Small Plots Pounds Per Acre	Large Plots Pounds Per Acre
Alcross, a resistant variety	1,735	1,260
Resistant Alaska*	1,854	1,286
Susceptible Alaska	1,426	1,066
Maryland Alaska	1,998	1,540
Increase of Maryland Alaska over the average of Alcross and Resistant Alaska	203	267
Increase of Maryland Alaska over Susceptible Alaska	572	474

*Variety not named; seed supplied by a large firm doing business in the State.

These yields give a little better idea of relative behavior when reduced to percentages, as in the following table.

RELATIVE YIELDS OF VARIETIES OF PEAS RESISTANT AND SUSCEPTIBLE TO WILT, GROWN ON WILT-SICK SOIL, 1932.

	Small Plot	Large Plot
Per cent of increase of resistant varieties over the susceptible	31	28
Per cent of increase of Maryland Alaska over other resistant varieties	11	21
Per cent of increase of Maryland Alaska over susceptible Alaska	40	44

Maryland Alaska has been developed for canning purposes but it may be used in the market garden or the home garden where an early starchy pea is desired; and also, where wilt has caused the failure of the pea crop. The seed supply of this variety is being multiplied so rapidly that in another year or two, there will be enough seed available to plant all of the wilt-infested soil in Maryland.

The following have co-operated generously with the University of Maryland in the development of Maryland Alaska and in the multiplication of the seed up to its present status: Charles T. Wrightson & Son, canners of Easton, six years; the H. Weber & Sons, florists of Oakland, two years; Senator Nelson H. Fooks of the Mt. Airy Canning Co., at Mt. Lake Park, two years; and the Sioux City Seed Company of Sioux City, Iowa, three years in their seed-growing fields in Montana, Idaho and California. Without the help of these co-operators, the present stock of more than a thousand bushels of Maryland Alaska seed would have been impossible.

(Lantern slides were shown.)

SECOND SESSION

Thursday, January 5, 1933

The second session was devoted to a symposium on potatoes under the leadership of Dr. J. H. Beaumont, head of the Department of Horticulture, University of Maryland.

PROBLEMS IN POTATO PRODUCTION IN MARYLAND

By J. H. BEAUMONT,

University of Maryland.

The white potato is one of the most important agricultural and food crops of the country. In Maryland more than 30,000 acres are planted annually. This acreage exceeds that of silage corn, is almost as great as that planted to tobacco, is greater than the acreage planted to barley and soy beans. It is greater than the acreage planted to any vegetable crop except sweet corn and tomatoes. This crop is of particular interest because of the range of soil and climatic conditions under which it is grown, the different markets served, and the varieties best adapted to the varying conditions. Diseases and insects take a tremendous toll each year and the expense and care involved in maintaining healthy stocks is enormous.

Three crops are grown in the State depending upon regional growing and market conditions. In Southern Maryland and on the Eastern Shore the early or market garden crop is of great importance. The crop is planted in February or early March and is marketed, harvested as new potatoes. Earliness of maturity and yield are of great importance because the crop must not overlap too much on the Norfolk Virginia movement and be out of the way before the New Jersey and Delaware movement begins. Harvesting is determined mostly by market conditions and secondly

by stage of maturity and weather conditions. Ordinarily no seed is saved from this crop because of difficulty and expense of storage, neither can seed of this crop be successfully planted as a second or late crop with uniformly good success because of difficulties with germination and of obtaining a good stand. Seed harvested from this crop is usually affected by a certain condition called "spindling sprout" which affects the vigor of the plant and the cause of which is unknown. Seed for the early crop is usually obtained from Maine or Prince Edward Island although we believe that seed grown in Western Maryland would be as cheap and of as good quality as that from these sources. The growing of certified seed in Western Maryland for the early crop should be encouraged particularly if the quality and price compare favorably with other seed.

A second or late crop is planted in the early sections from seed kept in common or cold storage during the previous winter and spring. Although this crop does not compare in market value with the early crop it is nevertheless of great interest and value to the growers in these sections. It has a local market value in supplying late potatoes in competition with northern grown potatoes but the yield is usually low and the varieties and quality are poor. The McCormick and Jersey Redskin seem to be the varieties best adapted to the growing of a second crop, but they have become so diseased that it is now almost impossible to obtain good seed. Dr. Jehle is making a strenuous effort to save these varieties and we hope that he will be successful. These varieties have the advantage of keeping well in common storage, of germinating and giving a good stand in the hot summer without rotting in the ground and of yielding remarkably well under these conditions. They are very rough, unattractive and of low quality. However, we believe that varieties can be produced which will have the desirable characteristics of the McCormick and which will be of higher quality as well. Many seedlings from our breeding work are being selected for trial under these conditions.

To secure such varieties would be of tremendous value, especially if they could also be used as an early crop. The early potato grower would be able to save his own seed from a second crop and the second crop would be of greater value from the standpoint of market quality and for seed.

The Department of Horticulture, co-operating with the United States Department of Agriculture and with Dr. Jehle is attempting to develop by breeding, better early varieties for the early crop and to improve the varieties used for growing the second crop. The improvements we are seeking have to do with the size, shape, smoothness, earliness, and quality of the early potato and the keeping quality, germination, resistance to tuber rots, mosaic resistance, yield, and cooking quality of the second crop varieties.

In central and Western Maryland only the fall crop of potatoes is grown. The crop is grown for market, and, especially in Western Maryland, for seed. Our problems here are to maintain and to improve varieties for market and seed purposes. Dr. Jehle, by careful and energetic work, has built up large stocks of certified seed and more and more the growers are improving their methods and the quality of their seed stocks. In a few years there should be a surplus of good seed for sale to Eastern and Southern growers. Dr. Jehle is also testing the new varieties being developed by the Department of Horticulture, and by the United States Department of Agriculture. These tests are being conducted in the important potato growing sections of the State. He is building up disease free seed stocks of the more promising varieties and with his assistance we will have a number of varieties for wide test within a few years.

Briefly, therefore, the Maryland potato improvement program involves the breeding of high quality, adapted varieties for all the important potato sections of the State; the maintenance of disease free stocks of the present varieties, and of the new varieties as they appear; the building up of an interchange of products within the State, and consequently a greater unity and interdependence of our agriculture.

PROGRESS WITH CERTIFICATION OF POTATO STOCK

By R. A. JEHLE,

University of Maryland.

Climatic conditions in Maryland are favorable for the production of three types of seed potatoes. Many States produce much larger quantities of seed potatoes than Maryland but few grow more than one type. The three types of seed potatoes which can be grown in Maryland are mountain grown seed, late harvested late seed and second crop Irish Cobbler seed.

Mountain Grown Seed:

Mountain grown seed can be produced only in the mountainous regions of the State where the elevation is 2,000 feet above sea level or more. This limits its production to Garrett County and the western portion of Allegany County. In these portions of the State the climate is similar to that of the Northern seed potato producing States and the same varieties thrive. At the present time the Rural Russet and Smooth Rural varieties are being most extensively grown. A few Green Mountain and Irish Cobbler seed are also being grown. Seed certification work was begun in Maryland with mountain grown Irish Cobbler seed by Professor C. E. Temple in 1915. Under the plan of certifying followed at that time, seed stock inspections were made by representatives of the University of Maryland. Potatoes which conformed to standards set by the University were recommended for certification by the Western Maryland Seed Potato Growers' Association, which was organized for the purpose of certifying, storing and marketing seed potatoes. For awhile, this organization did a thriving business and approximately ten to fifteen thousand bushels of certified Irish Cobbler potato seed were certified every year. Most of this seed was of high grade and relatively free from

diseases. During the World's War the price of table stock rose to such heights that many growers did not care to make the extra effort necessary for certification, and hence lost interest in the Association. After that the interest in the production of mountain grown Irish Cobbler seed began to decrease and now only a few hundred bushels are being grown. Meanwhile, demands for certification of potato seed came from potato growers outside of the Association and in 1924 the plans for seed certification in Maryland were revised. Under the new plan which is still in force, seed potatoes are certified by the Maryland Seed Certification Board which consists of the heads and Extension specialists of the following departments: Plant Pathology, Horticulture, Entomology, Agronomy and Marketing. The progress of certification of mountain grown seed can be judged from the following figures:

	1924	1925	1926	1927	1928	1929	1930	1931	1932
Acres eligible for certification	34.25	38	30.17	15	14.45	27	47.25	67.25	106.25
Bushels eligible for certification	2,025	5,975	5,800	1,305	1,855	6,952	6,963	15,213	29,452

It will be noted that there was a decrease in the amount of mountain grown seed certified from 1925 to 1929. This was due mostly to the decrease in the production of mountain grown Irish Cobbler seed. Since 1929 there has been a steady increase in the amount of mountain grown seed produced and this was due to the introduction of 100 bushels of certified single tuber strain Rural Russet potatoes by the Argicultural Department of the Baltimore and Ohio Railroad. These potatoes were distributed among 23 club boys. This seed did so well that it stimulated the production of certified seed with the result that there was more mountain grown seed produced this year than has been produced any year since certification was begun in the State.

Late Harvested Late Seed:

Two varieties of late harvested late potatoes are being grown for seed in the State, Jersey Redskin and McCormick. Both of these varieties are characterized by vigorous vine

growth which remains green until killed by frost. In both varieties tuberization takes place during the short days of autumn and good stands can be obtained from seed kept in home storage from the time they are harvested until they are planted.

Prior to 1925 the McCormick variety was practically the only late harvested late potato variety grown in the State but all of the seed stocks became so severely diseased that profitable yields could no longer be obtained and the Jersey Redskin variety has been substituted for it by many growers since that time. However, the Jersey Redskin never became as popular as the McCormick. In 1926 McCormick potato seed was planted from seed obtained in Pennsylvania. This was better than home grown seed but soon it too became diseased and practically no more McCormick was grown. In 1927 attempts were begun to build up a disease free strain by selecting and digging healthy hills in a field of McCormicks on the farm of Handy Truitt near Snow Hill. He had used seed obtained from Pennsylvania. Eyes were cut from each tuber and the tuber was indexed. The eyes were planted in the spring and several disease readings were made. All tubers which produced diseased plants were discarded and the healthy tubers were planted in July. The first field was lost by fertilizer injury and the work was repeated again in 1928. From 1928 to 1930 tuber indexing was continued and a few baskets of healthy tuber were secured. In 1930 only a few baskets of very small tubers were obtained on account of the drouth. These were planted whole in 1931 and the field which grew from these tubers was so free from diseases that it was eligible for certification. This year four hundred bushels of McCormick potato seed were eligible for certification. Tuber indexing will be continued with a portion of this seed stock so that the variety can be kept free from virus diseases. With the increase in the planting of the Jersey Redskin variety the seed stocks are gradually becoming more diseased and the interest in certification of this variety is increasing with the increased demand for certified seed. This year 21 acres

of Jersey Redskin potatoes were eligible for certification with a total yield of 3,425 bushels.

Second Crop Irish Cobbler Seed:

Second crop Irish Cobbler potatoes are grown in the two southern Eastern Shore counties, Worcester and Somerset. There potatoes are planted about the first of August from seed which is kept in cold storage from the first of April until planting time.

Irish Cobblers have been grown in Maryland for seed for many years. Their principal advantages over Northern grown seed are their smaller size which makes them more suitable for planting and makes them go farther, and their freedom from certain seed-borne diseases, such as Black Leg and Stem End and Vascular Discoloration. No second crop Irish Cobbler potato seed was certified prior to 1923 and only a small amount of seed from one grower was certified at that time. Up to this year there has been a steady increase in the amount of second crop Irish Cobbler potato seed which has been certified excepting in 1930 when the crop was almost a total failure, on account of the drouth. This year the amount of this seed which was certified was much less than last year due to decreased interest in seed production on account of low prices received for table stock during the past two years. The amount of second crop Irish Cobbler seed potatoes certified since 1924 is as follows:

	1924	1925	1926	1927	1928	1929	1930	1931	1932
Acres eligible for certification.....	95.25	93	102.26	232.75	184.5	274.75	232	374.5	213.25
Bushels eligible for certification.....	8,700	6,055	9,425	24,917	17,936	29,199	8,945	48,590	24,171

Total Amount of Maryland Certified Seeds:

The amount of seed potatoes eligible for certification in Maryland this year by varieties is as follows: Irish Cobbler, 24,401 bushels; Rural Russet, 20,231 bushels; Smooth Rural, 8,785 bushels; Jersey Redskin, 3,425 bushels; McCormick, 400 bushels, Green Mountain, 165 bushels, and Katahdin, 1 bushel.

I have had the opportunity to observe many fields of potatoes grown from Maryland certified seed both in Maryland and New Jersey and without exception the yield and quality of the potatoes produced in these fields were just as good or better than the yield and quality of potatoes produced in fields grown from other seed sources. Besides having the advantages of all certified seed namely freedom from diseases and mixtures, Maryland certified seed has the additional advantage of being produced within a short enough distance from the farm so that they can be brought by truck rather than shipped by freight or express. This nearness also gives the purchaser an opportunity to inspect the fields and crops of several growers thus enabling him to select the seed which best suits his needs. Requirements for potato seed certification in Maryland are as strict or stricter than in most other States and a bin inspection is compulsory just prior to shipment of the seed. Thus the purchasers of Maryland certified seed is assured of the highest quality of certified seed potatoes obtainable anywhere.

Vascular Discoloration:

One of the most serious problems which confronts the Maryland potato grower today is the control of stem end and vascular discoloration. Weather conditions seem to have favored its development during the past few years. At any rate, it has increased at an alarming rate since 1929. Sometimes it can be detected by a shriveling and rotting of the stem end but usually it cannot be detected without cutting into the tuber. So objectionable are infected potatoes on the markets that they must be sold at reduced prices if they can be sold at all. In one lot of potatoes grown in Baltimore County this year, 90 per cent of the tubers were infected and in Allegany and Garrett counties many lots were found with from 10 to 50 per cent. No varieties seem to be immune to stem end and vascular discoloration, but the most has been found in the Rural Russet variety. Practically none has been found in late harvested seed potatoes grown in Worcester and Somerset counties. The only known

control method for this disease is the use of seed practically free from stem end and vascular discoloration combined with a rotation in which potatoes are not grown on the same land oftener than once in every four years. Potato growers should purchase only seed which is inspected just prior to shipment since this trouble may develop in storage and as stated previously, one of the requirements for Maryland certified seed is that it shall be inspected just prior to shipment. Purchasers of Maryland certified seed potatoes should insist that every bag or barrel be tagged with the official seal and tag of the Maryland Seed Certification Board. If potato seed are purchased without being tagged, the purchaser has no way of knowing whether they are free from vascular discoloration unless he can inspect them himself.

In conclusion I would like to recommend the following procedure to all Maryland potato growers:

1. If possible, plant only Maryland certified seed which has been tagged and sealed with the official tag and seal of the Maryland Seed Certification Board.

2. Do not purchase certified seed from other States without a guarantee that it has been inspected just prior to shipment.

3. Do not purchase any seed with tags even if the words "certified seed" are used unless the statement that they have had two field and one bin inspection by some disinterested party such as a State Department of Agriculture, State Seed Certification Board, State Experiment Station or Agricultural College, is printed on them.

4. Home grown seed should not be used unless the field in which it was grown was found to be practically free from virus diseases. If you plan to use home grown seed inspect it now for stem end and vascular discoloration. If over 5 per cent of the tubers have vascular discoloration extending more than one-half an inch into the flesh of the tuber do not plant the seed.

5. Plant your potatoes in a field in which potatoes have not been grown for at least four years.

POTATO BREEDING

By F. J. STEVENSON,

United States Department of Agriculture.

The cost of producing marketable potatoes is greatly increased by the losses due to the many diseases which attack the growing crops and the tubers in storage. Measures of disease control cost the growers millions of dollars annually and in spite of the precautions taken millions of bushels of potatoes are lost each year.

Among the most disastrous diseases which attack the potato are the late blight and the so-called "running out" diseases caused by the attacks of viruses. While late blight can be so controlled by intelligent spraying as to prevent appreciable loss to the crop, it is nevertheless a fact that with the usual spraying practiced by most growers severe losses do occur in epidemic seasons. The severity of late blight fluctuates from year to year but the epidemic years occur all too frequently. A report in the 1932 Year-book of Agriculture says: "To an observer in the United States for the first time in 1923 late blight of potato might have appeared to be a minor disease, for the estimated loss that year was less than 0.2 per cent. In 1921 and 1929 the loss from this disease was estimated at less than 1 per cent. In 1920 on the other hand the estimated loss from this disease alone was 8 per cent of the total crop and in 1926 and 1928 it reached approximately 7 and 6 per cent respectively." This may seem like a small percentage but when it it considered that potatoes make up about one-half of the total value of our vegetable crops and that the average number

of bushels grown for the last 10-year period exceeded 350,000,000, it can be readily seen that a small percentage such as reported for 1920, 1926 and 1928 aggregate huge losses, in fact on the average approximately 25,000,000 bushels for the three years of severe epidemic. The year 1932 was another blight year for certain sections of the potato growing regions and again the potato growers suffered severe losses.

Another group of diseases which are disastrous to potato production are the virus or so-called "running out" diseases. These are spread mainly by insects. In the case of some of them the virus is carried from diseased to healthy plants by aphids or plant lice. The disease spreads so rapidly that certain varieties of potatoes will become 100 per cent diseased in the course of two to three years. The diseased plants have a sickly "run out" appearance and the yield of tubers will be decreased 25 per cent or more.

Experience has shown that in some localities a fairly high degree of success has been achieved in the control of this group of diseases by tuber-indexing, early harvesting and by rigid roguing of tuber-unit isolated seed plots, while in other sections these methods have met with failure.

All these operations, however, add to the cost of production, and even with all this work many potato growing regions cannot produce their own seed but must obtain it from certain Northern States or provinces of Canada.

Soil borne diseases such as common scab, rhizoctonia and fusarium wilt also exact their toll. Control measures for these diseases are comparatively ineffective, especially if the crop is to be grown in soil infested with the organisms causing the disease.

Disease resistant varieties are the ultimate solution for all these problems in potato growing. Disease resistance in itself is of little importance, however, unless it is combined with other desirable commercial characters such as shape,

color, good cooking quality, smoothness, shallowness of eye and above all high yielding ability.

The potato breeding project of the United States Department of Agriculture is carried on co-operatively with a number of State experiment stations. This arrangement is more necessary in the case of potatoes than with many of the other important food crops for a number of reasons. Among the various States there are great differences with respect to the problems which each has to face. In some States true seed cannot be obtained which fact in itself eliminates the possibility of a program based on hybridization and selection. In some States, too, diseases of all kinds are so virulent that it is very difficult, if not impossible, to maintain good breeding stocks. As an illustration of the varying problems met with in different States, only the other day one of our best growers in an important potato growing State cautioned me against wasting time and money in breeding potatoes for late blight resistance, as he said they could control this disease by spraying, on the other hand every effort should be put forth in trying to find varieties resistant to the virus diseases. Again in another potato growing State an influential man told me that he was not so much interested in our breeding for resistance to virus diseases but that if we would come along with a blight resistant potato they would all be for it. In still another State I have been told that virus diseases and late blight do not amount to anything but more time should be spent in developing varieties resistant to the soil-borne diseases. Also they would like an early variety or two that could withstand a few degrees of frost for some of their Northern peat lands. Iowa would be satisfied with a smooth Irish Cobbler, one with a little better shape and shallow eyes. Maryland would like a potato with the habit of growth of the McCormick, but with greater resistance to various diseases, smoother, better color and more desirable table quality.

For a number of years the United States Department of

Agriculture has been trying to solve some of these various problems and real progress can be reported at this time. Some of the States have become very much interested, believing that they see great possibilities for a breeding program in their own State. As a consequence the potato breeding program was reorganized a few years ago on a strictly co-operative basis between certain of the State experiment stations and the United States Department of Agriculture. The breeding material which had been under development for a number of years at Presque Isle, Maine, was distributed to the various stations for test or to be used as parent material. In several States where the conditions make it possible to produce true seed, complete breeding programs of hybridization and selection are carried on. Other States grow seedlings from seed which at the present time is either produced at Presque Isle, Maine, or at Duluth or Castle Danger, Minnesota, where conditions are favorable for seed production. Tubers of promising selections are also distributed from Presque Isle, Maine, and named and numbered varieties are sent out in larger lots for yield tests in various States.

The main purpose of the early work in potato breeding was to find varieties resistant to late blight. Introductions and selections were made and hybrid progenies tested for this purpose. This work was only well started when a more serious group of diseases claimed the attention of the plant breeders. These were the virus or so-called "running-out" diseases of the potato. A program was immediately begun to produce varieties resistant to these virus diseases. One of the commonest of these virus diseases in Maine, is what is known as mild mosaic. The program was therefore planned to study the resistance to this disease and if possible produce varieties which combined this resistance with other desirable characters such as smoothness, shallowness of eye, color, cooking quality and yield. A search was made among the seedlings and varieties for strains which were apparently resistant to mild mosaic under field conditions. A cross was made between two of the seedlings selected and

several of the segregates were found to be more resistant than either of their parents. One of these, Katahdin, has been very resistant to mild mosaic since it was produced in 1923. It combines with this resistance good shape, shallow eyes, and good yield. It has the tendency to maintain its good shape under very adverse conditions.

Another seedling from the same parents is also resistant to mild mosaic. It is a high yielder and is somewhat earlier than the Katahdin variety. For this reason it will be better adapted to certain growing conditions than is the Katahdin. A cross was made between these two seedlings in 1928. From this cross a number of seedlings have been obtained resistant to mild mosaic some of which are quite promising from the commercial standpoint. No variety has yet been found which is resistant to another virus disease, spindle tuber, but the fact that resistance to mild mosaic has been shown to be heritable offers hope that varieties can be produced resistant to some of the other virus diseases.

During the last year several progenies were tested for late blight resistance. A very heavy epidemic of late blight was prevalent but a few of the seedlings stood the test showing a high degree of resistance. Further tests will have to be made before final conclusions are drawn but the results are very encouraging.

To furnish new material for the co-operative plant breeding work an expedition was sent to South America in the winter of 1931-32. This expedition brought back a large number of varieties of potatoes from Chili, Peru, and Bolivia. The stock of these varieties is being increased for distribution to the co-operating State experiment stations where they will be grown and tested for resistance to the various diseases. Some of these were obtained in the higher altitudes of Peru and Bolivia. It is quite possible therefore that they are frost resistant.

Few, if any, of these introductions have commercial possibilities but if they are found to carry one or more factors

for desirable genetic characters such as disease or frost resistance, hybrids will be made in an effort to combine these characters with the economic characters of the varieties which are now available.

SUMMARY

The plant breeding program which is co-operative between several of the State experiment stations and the United States Department of Agriculture, has for its objective the reduction of the cost of producing potatoes by breeding new disease resistant varieties.

At present attempts are being made to combine resistance to mild mosaic, late blight, scab, and fusarium wilt with other important characters such as yield, shape, depth of eye and desirable cooking quality.

Not all State experiment stations can carry on a complete potato breeding program since it is difficult, if not impossible, for some of them to produce true seed. At present hybrid and inbred seed is furnished such stations from Presque Isle, Maine, and the University of Minnesota. In addition to this, numerous seedlings are grown from tubers furnished by the co-operators and tests made in various States.

New varieties have been produced, some of which are resistant to mild mosaic, others resistant to late blight, and at least one which has been found resistant to common scab.

Two new varieties are being distributed which are resistant to mild mosaic. One of these, Katahdin, is a high yielding, smooth, shallow-eyed potato. The other one is similar to Katahdin in many of its characteristics but is somewhat earlier, and for this reason will be better adapted to certain sections.

SUGGESTIONS FOR THE HANDLING OF SEED POTATOES INTENDED FOR LATE CROP PLANTING

By WILLIAM STUART,

United States Department of Agriculture.

In these days of low prices, and decreasing consumption due to lack of purchasing power, it is fitting that the potato grower should give thoughtful attention to every possible means of cutting production costs. It is generally recognized that the most effective method of lowering the unit cost of any farm product is that of increased yield per acre through the adoption of up-to-date cultural practices. In the case of potatoes good seed is one of the most important factors necessary to large yields.

The first requirement of good seed potatoes is that they shall be as free as possible from seed borne diseases such as the various forms of virus diseases. That means, as a rule, the use of certified seed.

Assuming that either home or foreign grown certified seed potatoes are used, it is quite important to insist that they shall be as free from mechanical injuries as may be possible, because the keeping quality of mechanically injury tubers has been shown to be inferior to that of uninjured ones, hence the desirability of the latter. Injured tubers either from cutting, bruising or skinning are more susceptible to infection from parasitic or saprophytic fungi, or bacterial organisms.

Recent studies by Hastings,* Hardenburg,† Werner,‡ and others, have furnished ample evidence of excessive injury, in many cases, in harvesting the potato crop, be it either seed or table stock.

The next suggestion in the care of seed potatoes is to get them into the storage house with a minimum amount of surface injury.

There is still some difference of opinion as to the best or optimum storage temperature at which to hold seed potatoes. The holding of seed for late crop planting involves a lower temperature than is necessary for those intended for early spring planting. In the case of seed to be planted in March or early April, a temperature of 50 degrees F. may be found more satisfactory than 40 degrees or lower. During the deep rest period of the potato, temperature within reasonable limits is not so important as it is after this stage is passed.

Seed potatoes intended for late June or July planting could be stored for the first 90 days at a temperature of 50 degrees F. and then gradually lowered to 40 degrees F., or below, for the remaining period. The higher the temperature maintained during the early storage the greater the necessity for maintaining a relatively high air humidity in order to prevent undue loss of moisture through increased respiration.

There is another rather important storage factor which until recently has received scant consideration. This factor is that of the healing over of wound injuries. When newly harvested potatoes are stored at a temperature of 50 degrees F. to 60 degrees F. with a relatively high humidity the injured surfaces rapidly heal over and thus lessen the chance of disease infection.

During the latter part of May and throughout June, and early July, most growers find it difficult, if not impossible, to maintain a sufficiently low temperature to prevent an undue amount of germination in ordinary storage. When cold storage is not available it is suggested that the tubers be either held in shallow trays exposed to light or spread out thinly in a room or under a shed, shielded from the direct rays of the sun. Under such conditions short, stubby, tough sprouts develop rather slowly and are not easily broken off in handling. An exposure of four to six weeks is possible without undue sprouting.

Suberization of cut sets.—In late crop planting it not infrequently happens that the soil is hot and dry. Under such conditions the planting of fresh cut sets may result in poor stands due to the fresh cut surfaces coming in contact with the hot soil and through the loss of moisture. Furthermore, such conditions are favorable to disease infection.

Recent studies by Peacock, Wright, and others, have shown that when well suberized sets were planted in comparison with fresh cut sets the former gave a quicker and higher percentage of germination, and as might be expected an appreciable increase in yield.

Under extremely favorable soil temperature and moisture conditions and intelligent handling of the fresh cut sets the differences in time and percentage of germination between suberized and fresh cut sets might be expected to be materially lessened as would also that of yield.

Method of suberizing cut seed.—The same temperature and humidity conditions should be supplied for the prompt and satisfactory healing over of the cut surfaces of potato sets as that recommended for the healing over of mechanical injuries resulting during the harvesting and handling of the crop. Under favorable conditions a 7 to 10-day exposure to a 50 degree F. to 60 degree F. temperature and 85 to 90 per cent humidity generally insures a thorough corking over of the cut surfaces. It is desirable on the second or third day to turn the cut seed over in order to break apart sets adhering to each other.

In the suberization of cut sets it is important to observe the following preliminary precautions:

1. To disinfect the seed before cutting it.

2. To thoroughly disinfect all containers used in handling it.

3. To disinfect the room in which the cut sets are held during the process of suberization.

It may not be amiss to state that these precautions have been found necessary, in some instances at least, to prevent infection of the fresh cut surfaces resulting in a slimy decay of the exposed cells, thus preventing the proper healing over of the wound.

Time of suberizing the seed.—Generally speaking, there is no particular best time for suberizing cut sets. It may be done at any time during the spring months or it may be delayed until ten days or two weeks before planting. The objection to late suberization is that unless extremely favorable storage conditions have been maintained the tubers will have begun to germinate and cannot be as easily handled, furthermore under such conditions unless the seed has been disinfected at an earlier date the developing sprouts will be more or less injured by the disinfecting agent. An objection might be raised to the earlier treatment unless followed immediately by the cutting and suberization of the sets because there would be an opportunity during the interim for the lodgement of disease organisms on the tubers which might serve as sources of infection of the fresh cut sets.

Another factor which should be taken into consideration when the cutting and suberization is delayed until shortly before planting, is that of temperature. It frequently happens in this region that high temperatures prevail in late June and July. Experience has shown that temperatures much above 80 degrees are likely to result in poor suberization and in many instances in decay of the sets. It is desirable, therefore, to avoid this danger by earlier cutting of the seed or by awaiting more favorable temperature conditions.

Experimental studies by Lombard and the writer indicate that it is possible to successfully hold well suberized sets for a period of five or six months without appreciable decrease in vitality. We do not, however, recommend that seed potatoes be cut that far in advance of date of planting.

It is never advisable to remove from storage and immediately cut and plant seed that has been stored at a tempera-

ture of 40 degrees F. or below. Under such circumstances the tubers should be removed from cold storage a few days before treatment and cutting in order to allow them to warm up. Gradual warming up is, of course, more desirable than a sudden change from 40 degrees F. or less to 70 degrees F. to 90 degrees F. or more degrees. Temperature shocks of this sort are believed to be more or less harmful.

Seed handled in the manner just described may be expected to give a high percentage of germination and a satisfactory yield provided the plants are supplied with an abundance of plant food and are given proper cultural care.

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MARYLAND GOLDEN SWEET POTATO

By THOMAS H. WHITE,

Maryland Agricultural Experiment Station.

Plants of new types and varieties are secured from the older kinds by means of seed or bud variations. When a new variety is to be developed from seeds the plants are usually cross pollenized, the pollen being removed from the anthers of one parent and placed on the stigma of the other. In nature bees and insects do this on a great many species and much pollen is also distributed in the air currents, but with plants which do not normally blossom in this section of the country (for instance, the sweet potato) the opportunity for a new type must come from bud variation. Variation in the buds and branches of many cultivated plants which are propagated from buds, scions, cuttings, or root divisions are fairly common. Some of the more common

bud variations, or sports as they are called, occur quite often on the apple and the rose. With apples a branch may be found upon which the color of the fruit has changed so that a normally striped apple may be a solid red, and buds taken therefrom will produce not striped apples, but fruits having skins that are red all over.

Generally the difference between a bud sport and the parent is a matter of color, and changes in the vegetative growth, such as shape of leaves or vigor of stem, is not as common. However, it would seem that sometimes the color may carry with it some principle which makes the plant more resistant to disease, and therefore somewhat more vigorous in growth. A case of this kind familiar to some of you is the McCormick potato, the white sport of which succumbed much sooner and more readily to the mosaic disease than did the original pink-eyed type. Valuable bud variations are often missed by growers unless they are looking for them. There is a rose variety called Radiance, which was produced from seeds and the blossoms were pink in color. The Gude Bros. Company of Washington, D. C., grew them in quantity in their greenhouses. The blooms were all cut in the early morning and sent into the store in the city. One morning after the supply had been sorted and placed in water in the ice box, Mr. William F. Gude, happening to walk through the room, picked up from the floor, in the discarded material which was to be swept away with the refuse, a short stemmed red rose. It did not look like any variety they were growing, so he had the men take the small branch back to the greenhouses and root it. Thereafter they propagated it in quantity, it turned out to be a red sport of the Pink Radiance, having the same characteristic growth, but the blossoms were deep red in color. This rose was named Red Radiance, and owing to its vigor and hardiness has become a very popular garden variety.

The pigment which makes the deeper color in fruits may sometimes carry with it something which adds to the flavor or food value of the new type. In melons the deep yellow

fleshed varieties carry the musky or aromatic odor and flavor that is absent in the green fleshed kinds. Yellow corn has been found to carry a vitamin that is absent in white corn, and for that reason the yellow corn may cause the animals fed on it to make a better growth.

The group of sweet potatoes grown in Maryland and New Jersey and Delaware are somewhat different from those grown further south. The names Big Stem and Little Stem Jersey fairly represent the group, although there are some strains which have been given other names. They are usually more regular in shape and the leaves and vine characters are more refined than of the Yam types, which are grown in the Soutern States. Big Stem Jersey has the largest leaves and the strongest vines of the group, and in this particular are almost as large and heavy as the Southern Yams. The outer skin of the roots of the Big Stem Jersey is classed as brownish yellow and the flesh light yellow or deep cream.

The stock of Big Stem Jersey, from which the Maryland Golden Sweet was developed, had been grown on the Maryland Agricultural Experiment Station farm for twenty-eight years. Eighteen of those years it was planted on some plots of clay loam soil which were arranged for a comparison between manure and commercial fertilizers. Later a gravelly clay loam was used. There is no soil on the farm similar to the sandy soils of the Eastern Shore, but fair crops were grown and there did not seem to be many of the diseases that are found in the sandy soils. Some years ago it was noticed that many of the potatoes were of a deep yellow color and seemed to have more flavor and sweetness than those of the light yellow type. It was also observed that when raw the ones which were deep yellow when cooked had veins of deeper yellow color running through the flesh. As these potatoes seemed to be of better quality and in demand, all the stock bedded for plants were examined by cutting off the ends and only those showing the deep yellow veins were bedded. This

was done for several seasons, and while the deep yellow specimens were very much in excess, there were always some of the lighter colored type to discard.

In the season of 1928, when the crop was being dug, one of the men called attention to a hill of potatoes having salmon colored skins. Upon further search another hill of the same character was found. These were carefully preserved through the winter and in the spring were bedded and as many plants as possible were grown from them. They were planted alongside the original type and seemed to have exactly the same kind of vine, but when the crop was harvested it was found that all the potatoes were uniformly alike in the salmon color of the skin and the deep yellow of the flesh. There was no need for further selection, as apparently we had discovered a bud sport which was so well fixed in character that all the buds thereafter came the same way.

In 1930 several bushels were distributed among growers on the Eastern Shore. Mr. Hotton, near Salisbury, seemed to think the new variety was deserving of his interest, so he gave it careful attention. During the past season Mr. Hotton grew a large acreage so that he would be able to put it on the market in quantity. Because the appearance of the potatoes were so yellow as to suggest gold, it was decided to give it the name of Maryland Golden Sweet. When put on the New York market the past fall the new variety became so popular as to bring twenty-five cents more per basket than the ordinary Big Stem, and its merits were written up in the New York papers and also broadcast from Albany by radio. It is said to be yielding better than the original Big Stems, so taken altogether the Maryland Golden Sweet may be considered an acquisition.

It is hoped that the stock will be kept pure. This should not be difficult, because rogues may be easily detected at digging time while the skins are soft and bright. Anything not showing the characteristic salmon gold color of

the skin should be discarded. And, if there is any doubt, a further examination may be made by cutting the end off the roots. If true to type the raw cut flesh should show up distinctly yellow veins, or rays, across the cut surface.

Growers should be on the lookout for new kinds of sweet potatoes; in fact, all vegetables, because the consuming public welcomes a change. I am very much in favor of standardized products, but I think this should be along the lines of grading and quality, or appearance, for, as the old saying goes, "Variety is the spice of life," and the appreciation and appetite of the public is always stimulated by it.

It has been instructive to me to notice the variety of bread products that the baker's truck brings to the door several times a week. Flour dough is the basis of them all, but the variety of rolls, buns, cakes, etc., that they get out of sugar and dough and some raisins is amazing. However, I am sure it stimulates trade because the housekeeper is always looking for something new to appease the wants and desires of the family appetite.

The nominating committee presented the names of the following persons as officers of the Association for the year 1933, and these were unanimously elected:

President—William N. Eyler, Flintstone, Md.

Vice-President—S. S. Merritt, Jr., Sparrows Point, Md.

Secretary Treasurer—W. R. Ballard, College Park, Md.

Board of Directors—R. T. Merritt, Sparrows Point, Md.; W. P. Hotton, Salisbury, Md.; James P. R. Edelen, Anacostia, D. C.

Delegate to Farm Bureau Federation—A. M. Todd, Sparrows Point, Md.

Director for Farm Bureau Federation — Joshua Lynch, Hyde, Md.

Representative on Agricultural Corporation — W. G. Lynch, Dundalk, Md.

The auditing committee reported that the treasurer's books had been examined and found to be in order. Balance in hand as of December 31, 1932, was $5.71. The report was adopted.

POTATO EXHIBIT

The exhibit of certified potato seed stock, displayed in co-operation with the Maryland Certification Board, evidenced growing interest in this project which is being fostered by the Association.

The prize winners in the various classes were as follows:

CLASS IX

POTATOES—IRISH COBBLER

First Prize—W. A. Ward, Pocomoke City.
Second Prize—F. J. Dukes & Bros., Girdletree.
Third Prize—E. F. Garletts, Selbysport.
Fourth Prize—Lester Shockley, Snow Hill.

CLASS X

POTATOES—RURAL RUSSETS

First Prize—Carl H. Everly, Accident.
Second Prize—Merle Garletts, Selbysport.
Third Prize—Orus M. King, Accident.
Fourth Prize—A. J. Richter, Accident.
Fifth Prize—Allen Kelly, Oakland.
Sixth Prize—G. W. Weitzell, Accident.

CLASS XI

POTATOES—ANY OTHER VARIETY

First Prize—E. F. Garletts, Selbysport.
Second Prize—Raymond Schlosnagle, Accident.
Third Prize—Samuel Hearn, Laurel.
Fourth Prize—Handy Truitt, Snow Hill.
Fifth Prize—H. J. Speicher, Accident.
Sixth Prize—W. Cissel Simpson, Simpsonville.

CLASS XII

SWEET POTATOES—ANY VARIETY

First Prize—W. T. Hotton, R. F. D., Salisbury.
Second Prize—F. J. Dukes & Sons, Girdletree.
Third Prize—Charles E. Dukes, Girdletree.

REPORT

OF THE

Maryland Stockmen's Association

Fourth Annual Meeting

January 4 and 5, 1933

BALTIMORE, MD.

FIRST SESSION

Lord Baltimore Hotel

Mr. J. W. Jones of Montgomery County, vice-president of the Maryland Stockmen's Association, in the absence of President H. D. Wolfe, called the meeting to order with the following brief welcoming address:

Gentlemen of the Maryland Stockmen's Association:

This is a surprise to me, as I had not expected to preside this morning. I think it mighty nice that we all can get together here once a year. Coming to these meetings is the only holiday I get during the year. I told the boys at the bank that I was going to quit everything and come to Baltimore, and I let everything drop and came, and I'm not going back until everything is over. I never go home from here without an increased appreciation of the Farm Bureau and its organization. I think there is nothing more educational than the meetings it sponsors, and I am sure you all feel the same way about it.

Chairman Jones then called for the report of the secretary-treasurer. The following report was presented and accepted:

REPORT OF THE SECRETARY-TREASURER

By B. E. CARMICHAEL,

College Park.

Mr. Chairman and Gentlemen:

The year 1932 has been one of reduced incomes for the livestock producers of Maryland. Notwithstanding that fact, the livestock producers of the State have gone forward with their production and improvement programs, with somewhat less of enthusiasm, perhaps, but with faith that the future will bring an improved situation. Though prices for livestock have been very low during much of the past year, few livestock producers have become so discouraged as to discontinue their regular production activities. Some new enterprises have been begun, and if times become "good" again, Maryland should go far during the next few years in eliminating scrub animals and inefficient methods of production.

A printed report of the January, 1932, Annual Meeting of the Association has been put in the hands of each member of the Association, and time will not now be taken to review that event. The 1932 Litter Contest, though not as large as in some former years, has resulted in the production of a litter larger than has been reported in any former year, and more will be heard of that important event at tonight's dinner-meeting, when awards will be made.

Sales of pure-bred rams have been held during 1932 at five well distributed points in the State—Timonium, Centerville, Pocomoke City, Boonsboro and Oakland. A detailed report of these sales by Professor Clark, who has had charge of them, will be made during this meeting.

Though the membership of the Association has not been as large as had been hoped for, yet, all things considered, the total membership of 77 is not a matter about which to

be especially discouraged. However, it does seem that there should be at least ten stockmen in every county of Maryland who would gladly pay one dollar for annual membership in this Association.

The News Letter has gone out each month. More items for use in it should be supplied by members of the Association. A definite expression from every member concerning the News Letter would be very valuable to the secretary.

FINANCIAL REPORT

MARYLAND STOCKMEN'S ASSOCIATION

January 4, 1933

RECEIPTS:		
Balance, January, 1932	$304.43	
One delayed membership, 1931	1.00	
Seventy-five memberships, 1932	75.00	
Banquet tickets, January, 1932	51.25	
Two memberships, 1933	2.00	
Twelve banquet tickets, 1933	12.00	
Total, balance and receipts		$445.68
EXPENDITURES:		
Expenses, headquarters room, 1932	$ 1.45	
James W. Stoddard, banquet at Claremont	85.00	
Baltimore Coach Co., transportation	15.00	
K. A. Clark, expenses 1931, LaPlata Ram Sale	38.22	
Farm Bureau Federation, 1932, dues	20.00	
University of Maryland Press, envelopes and letterheads	21.50	
Hennegen Bates Co., engraving trophy	1.75	
Students' Supply Store, stencils and paper	5.70	
Postmaster, College Park, 123 2c stamps	2.46	
Students' Supply Store, paper	4.35	
R. L. Showacre, J. H. Baugher portrait fund	10.00	
Students' Supply Store, stencils and paper	8.45	
Postmaster, 200 postal cards	2.00	
University of Maryland, telephone and telegraph bill	3.60	
Deficit, five ram sales	8.50	
Stamp tax	.68	
Total expenditures		$228.66
Balance, January 3, 1933		$217.02

CHAIRMAN JONES: Next we will have a report of the 1932 Purebred Ram Sales, conducted under the joint aus-

pices of this Association and the University of Maryland Extension Service. In the absence of Mr. Clark, this report will be presented by the secretary.

1932 PUREBRED RAM SHOWS AND SALES IN MARYLAND

By K. A. CLARK,

College Park, Maryland.

Following essentially the same procedure as followed in former years, a series of five purebred ram shows and sales was held during 1932.

The rams were presented in excellent condition, in spite of the fact that breeders were fully aware that prices would not rule very high. There seems to be a determination on the part of the purebred sheep breeders to make these sales a valuable and well established tradition in this State. Even though breeders are not now being largely rewarded for their efforts to bring this about, they are continuing along these lines. The rams were culled a little more closely than usual, and as a result proved appealing to buyers. Advertising was conducted along the same lines as last year. Considerable money was spent for paid ads in the county newspapers, but the principal publicity was through a series of news articles released concerning each sale. For the coming year it would seem advisable to reduce somewhat the amount of paid advertising and resort to other types of publicity to make the shows and sales well advertised.

Of particular note was the large number of rams taken by purchasers who had not secured rams in previous sales. A total of 81 new purchasers appeared in the list of 96 different purchasers.

The sales seem to be more soundly established and their influence more widespread at the present time than at any

time heretofore. Only by rigidly following the policies thus far held can this record be maintained and improved.

The following is a summary of this project:

SUMMARY

Sale	Number Rams Sold	Average Price Per Head	Number Different Counties Taking Rams*	Number Different Individual Purchasers	Number Purchasers Who Never Bought in Previous Sales	Total Cash Amount
Timonium	19	$17.36	5	18	18	$330.00
Pocomoke	25	11.62	3	22	21	290.50
Centerville ..	33	17.18	6	18	9	567.00
Boonsboro	19	13.63	3	17	16	259.00
Oakland	23	14.24	1	21	17	327.50
Totals	119	$14.91	18	96	81	$1,774.00

*Maryland Counties only.

CHAIRMAN JONES: Today we are fortunate in having with us Dr. Maurice C. Hall of the United States Department of Agriculture, Washington, D. C. He will now discuss a subject that is of importance to all stockmen of Maryland, *Some Important Animal Parasite Problems and Their Solution.*

SOME IMPORTANT ANIMAL PARASITE PROBLEMS AND THEIR SOLUTION

By MAURICE C. HALL,

Chief, Zoological Division, Bureau of Animal Industry,
United States Department of Agriculture,
Washington, D. C.

The business of a stockman is to raise and market livestock. It is not the simple business that it is thought to be by many persons who are urging a back-to-the-land movement for city people. The successful stockman must have certain qualities and abilities. He must have some knowl-

edge of breeding, feeding and farm management; he must have a love for animals if his animals are ever to figure in the beribboned groups of the show ring; and he must know something about markets, sales and similar business enterprises. With this equipment he may or may not be able to defeat the forces of bad weather, feed shortage, disease and depression, but without it he is hardly worth calling a stockman.

It is not in the scope of this paper to deal with the forces which will defeat the best of stockmen regardless of ability or energy, but it is within its scope to discuss the things which may defeat any stockman who overlooks or disregards them. Along the road to show-ring success and a balance on the profit side of the ledger are many helps and many handicaps. One of these handicaps is parasitism. Perhaps you have heard little about parasitism, but if you are a stockman you have dealt with it.

Parasitism in livestock is a condition in which parasites are present in or on livestock. Parasites are the unwelcome guests that live off other animals, and they include such animals as lice, ticks, worms and coccidia, and such plants as bacteria. The bacterial parasites are dealt with by bacteriologists, and will not be considered in this paper aside from noting the fact that you are well aware of the damage caused by bacteria in the production of tuberculosis, infectious abortion, mastitis and similar diseases. As a rule, these bacterial parasites force themselves on your attention by producing fever and other acute conditions difficult to overlook. When they enter your livestock as guests they promptly create a disturbance as a rule, and you are likely to be prompt in demanding that they leave the premises or quiet down.

The animal parasites do not force themselves on your attention. They invade your livestock rather unostentatiously, usually a few at a time, and they rarely stage a rough party and threaten to set the house on fire. They

attend to the business of feeding and breeding, and in a quiet way they upset the stockman's feeding and breeding program. While you are putting into your livestock the kinds and amounts of feed that are calculated to make gains in weight and condition, the parasites are feeding on your animals, and while you are breeding one calf from a cow, the worms from the same cow are breeding thousands of young worms, and these worms will produce runts and poor breeding stock.

While individual species of parasites have their preferences in the matter of diet, the total of all kinds harbored by your stock samples a large and variegated menu from an individual animal. Some lice are satisfied with the scales from the superficial skin, while others demand, and get, blood. Hookworms and the common sheep stomach worm prefer blood, but ascarids and some other worms are content to nibble off the tips of the intestinal cells. Swine kidney worms start with a diet of liver, and then change to a diet of leaf fat. It is not uncommon to find from hundreds to many thousands of worms in one animal, and the bill for their food and lodging is paid by you. This bill is payable at all times in loss of thrift. The loss of thrift may be just a loss of bloom, enough to disqualify an animal for the show ring; it may be loss in weight and condition; it may be the production of runts and unmarketable animals; and it may end in death.

In most cases the parasites do their work silently and without display. They may attack your young stock by prenatal infection before birth, or may attack soon after birth. If they do either thing, the young animal starts out as an unthrifty animal; as you watch it going down hill you remark: "Oh! well, that animal never will amount to anything," and when it dies you figure that you haven't lost anything and that there was nothing to be done about it. Nevertheless, you have lost something and there was something to be done about it. If the parasites attack later, you see the animal gradually fall off in condition, but

it is gradual, and you feel that there isn't much wrong; the animal isn't actually sick, and as soon as the pastures improve or the sunspots disappear things will be better. Finally you are disgusted with the animal and charge it off to profit and loss. In a quiet way the parasites have picked your pocket and made a getaway without your knowing what happened. Bacteria rob you boldly, and you call for the police in the form of a veterinarian, but the parasite robs its benefactor in a more sagacious manner and is allowed to take its time to its job of robbery.

All this, however, may seem to you to be a mere glittering generality, and you may ask: "What about Maryland? What parasites do we have here?" It so happens that these questions may be answered for Maryland in more detail than for any other State in the Union. For 45 years the Zoological Division of the Bureau of Animal Industry has been collecting parasites from livestock in Maryland, and we know more about its parasite fauna than we do about that of any other State. I have taken the trouble to go through the records of the parasite collection of the division for the State of Maryland, and the results are about what we would expect. Maryland is in the region of the Mason-Dixon line, and, as would be expected from that position, her livestock has almost all of the parasite species occurring in northern and southern livestock.

It would be simpler to say which of the parasites of livestock in the United States are not represented in our collection from Maryland than to name those that are represented. The exceptional ones not yet in our collection from Maryland include: The worst of the horse bots, *Gasterophilus haemorrhoidalis;* the worst of the horse tapeworms, *Anoplocephala perfoliata,* and one other horse tapeworm, *A. mamillana;* the cattle fever tick, *Piroplasma,* and *Anaplasma;* sheep liver fluke and the fringed tapeworm of sheep; and the eyeworm of chickens. It is very improbable that you will ever have to contend with cattle fever ticks or *Piroplasma,* as these have been eradicated under the super-

vision of the Federal Bureau of Animal Industry from 12 of the 15 States in which they formerly occurred, and are being eradicated from those parts of the three remaining States in which they still occur. Probably you will never be troubled by fringed tapeworms, as these have been confined to the West and appear to be losing ground. However, there is no assurance whatever that modern transportation in shipping stock for feeding and breeding purposes will not bring to you, in the course of time, the other parasites named and others not yet known to occur in the United States.

The parasites represented in the collections of the Bureau of Animal Industry from Maryland are as follows:

Horse parasites. There are 37 kinds of parasites from Maryland horses. Tapeworms: *Anoplocephala magna.* Nematodes: *Ascaris equorum, Oxyuris equi, Probstmayria vivipara, Strongylus vulgaris, S. edentatus, Gyalocephalus equi, Triodontophorus tenuicollis, Oesophagodontus robustus, Cylicostomum insigne, C. goldi, C. ultrajectinum, C. nassatum, C. n. parvum, C. catinatum, C. labratum, C. longibursatum, C. minutum, C. euproctus, C. pseudocatinatum, C. pateratum, C. bicoronatum, C. labiatum, C. poculatum, Poteriostomum ratzii, P. imparidentatum, Dictyocaulus arnfieldi, Habronema megastoma, H. microstoma, H. muscae, Setaria equina* and *Oncocerca cervicalis.* Arthropods: *Gasterophilus intestinalis, G. nasalis, Hypoderma lineata, Trichodectes pilosus,* and *Sarcoptes equi.*

Cattle parasites. There are over 20 kinds of parasites from Maryland cattle. Protozoa: Sarcosporidia. Tapeworms: *Moniezia expansa* (and probably some of the *M. planissima* collected at Washington, D. C.) and *Cysticercus bovis.* Nematodes: *Bunostomum phlebotomum, Oesophagostomum radiatum, Haemonchus contortus, Cooperia punctata, C. onchophora, Ostertagia ostertagi, Nematodirus sp., Dictyocaulus viviparus, Setaria labiatopapillosa, Oncocerca lienalis* and *Trichuris ovis.* Arthropods: *Tricho-*

dectes scalaris, Hypoderma lineata, Demodex bovis, Linguatula serrata, and various ticks.

Sheep parasites. There are 30 kinds of parasites from Maryland sheep. Protozoa: *Globidium gilruthi* and *Sarcocystis sp.* Tapeworms: *Moniezia expansa* and *Cysticercus tenuicollis.* Nematodes: *Ascaris suum, Bunostomum trigonocephalum, Oesophagostomum columbianum, O. venulosum, Haemonchus contortus, Trichostrongylus extenuatus* (= *T. axei*), *T. instabilis* (= *T. colubriformis*), *T. gracilis, Nematodirus filicollis, N. spathiger, N. abnormalis, Ostertagia circumcincta, O. trifurcata, O. ostertagi, Cooperia curticei, Dictyocaulus filaria, Muellerius capillaris, Trichuris ovis, Capillaria brevipes, C. longipes* (= *C. bovis*), *Gongylonema scutatum,* and *Strongyloides papillosus.* Arthropods: *Oestrus ovis, Melophagus ovinus,* and *Psoroptes ovis.*

Goat parasites. There are 21 kinds of parasites from Maryland goats. Protozoa: Coccidia. Tapeworms: *Moniezia expansa* and *Cysticercus tenuicollis.* Nematodes: *Skrjabinema ovis, Bunostomum trigonocephalum, Oesophagostomum columbianum, Chabertia ovina, Haemonchus contortus, Trichostrongylus colubriformis, T. capricola, T. vitrinus, T. extenuatus* (= *T. axei*), *Nematodirus spathiger, N. filicollis, N. abnormalis, Ostertagia trifurcata, O. circumcincta, Cooperia curticei,* and *Strongyloides papillosus.*

Swine parasites. There are 18 kinds of parasites from Maryland swine. Tapeworms: *Echinococcus granulosus.* Nematodes: *Ascaris suum, Globocephalus urosubulatus, Oesophagostomum dentatum, O. longicaudum, Stephanurus dentatus, Hyostrongylus rubidus, Metastrongylus elongatus, M. brevivaginatus* (= *Choerostrongylus pudendotectus*), *M. salmi, Gongylonema pulchrum, Arduenna strongylina, Physocephalus sexalatus, Trichuris suis, Trichinella spiralis,* and *Strongyloides ransomi.* Acanthocephala. *Macracanthorhynchus hirudinaceus.* Arthropods. *Haematopinus suis.*

Chicken parasites. There are over 25 kinds of parasites from Maryland chickens. Protozoa: Coccidia (*Eimeria tenella, E. maxima, E. mitis,* and *E. acervulina*), *Sarcocystis sp.,* and *Histomonas meleagridis.* Tapeworms: *Hymenolepis carioca, H. cantaniana, Davainea proglottina, Raillietina cesticillus, R. echinobothrida,* and *Amoebotaenia sphenoides.* Nematodes: *Ascaridia galli, Heterakis gallinae, Syngamus trachea, Gongylonema ingluvicola, Tetrameres americana, Cheilospirura hamulosa, Capillaria annulata,* and *C. retusa.* Arthropods: Lice (several species), *Liponyssus sylviarum, Cnemidocoptes mutans,* and *Cytodites nudus.*

Turkey parasites. There are over 20 kinds of parasites from Maryland turkeys. Protozoa: *Histomonas meleagridis* and *Eimeria meleagridis.* Tapeworms: *Metroliasthes lucida, Hymenolepis carioca, H. cantaniana, Davainea proglottina,* and *Raillietina cesticillus.* Nematodes: *Heterakis gallinae, Syngamus trachea, Tetrameres americana, Cheilospirura hamulosa, Dispharynx spiralis, Capillaria annulata, C. contorta, C. retusa,* and *C. meleagris-gallopavo.* Arthropols: Lice (several species), *Microspalax chaneyi,* and *Megninia cubitalis.*

Deducting duplicate records of the same species of parasite from two or more hosts, there are about 140 species of parasites from Maryland livestock, including as livestock chickens and turkeys. Undoubtedly there are other species of parasites collected from Maryland livestock, but credited as collected at Washington, D. C. Of the species reported, the large majority are definitely known to be pathogenic, destroyers of thrift at the best, and killers at the worst. They include: The large roundworm, pinworm, blood worms, cylicostomes, lung worm, stomach worms, bots, lice, and mange mite of horses; the tapeworms, hookworm, nodular worm, stomach worms, intestinal trichostrongyles, lung worm, lice, and ox warbles of cattle; the tapeworms, hookworm, nodular worms, stomach worms, intestinal trichostrongyles, lung worms, grub in the head, sheep tick, and scab mite of sheep; the coccidia, tapeworms, hookworm,

nodular worms, stomach worms, and intestinal trichostrongyles of goats; the hydatid, ascarid, hookworm, nodular worms, kidney worm, stomach worms, lung worms, trichina, thornhead, and lice of swine; the coccidia, tapeworms, ascarid, cecal worms, gapeworm, stomach worms, capillarids, lice, and mites of chickens; and the blackhead organism, cecal worm, gapeworm, stomach worms, capillarids, lice, and mites of turkeys. The stockman will recognize some of these as injurious; some that he will not recognize are equally injurious.

Just what harm do these parasites do? Some of them invade the tissues while the parasites are still larvae, and we are learning that at this stage they may cause considerable distress which is seldom charged to the parasites, as they are not looked for in the tissues. A striking case of this sort is the productions of thumps in little pigs by young ascarids passing through the lungs. Pinworms cause irritation in the horse, and the affected horse rubs the hair off the base of the tail. Blood worms sap the vitality of horses, and badly infested horses are unable to do a day's work. When the worms are removed the animals may gain a surprising amount in weight and condition. Lung worms produce a verminous bronchitis, which may terminate fatally. Some stomach worms and such intestinal worms as hookworms feed on blood, producing anemia and causing many deaths. Nodular worms interfere with the functioning of the intestine and produce unthrifty animals. Kidney worms not only injure swine; they may cause death, and the condemnations of leaf fat, livers and other parts in meat inspection in packing houses may run close to 30 cents a head in some areas. Trichina is a deadly parasite, which is transmitted to man when he eats raw or improperly cooked or unprocessed pork, and there has been a notable increase in reports of trichinosis in man in the United States of late years, with quite a number of deaths. Cecal worms carry blackhead. Gapeworms are deadly to young chicks. Some of the crop capillarids kill chickens and turkeys when the

parasites are numerous. Bots injure the stomach and intestine and produce unthrifty horses, and the bot flies annoy horses to the point where they are too busy with the fly to feed or too excited to handle. Ox warbles cause millions of dollars' worth of damage in hide injury and loss of meat and milk. Scabies is a serious thing in livestock of all sorts, ruinous to wool and hides, and sometimes deadly. Lice produce unthriftiness, and unthriftiness often makes the difference between profit and loss.

What can be done about parasites of livestock in Maryland? The question brings to light a curious situation. With Maryland spread out in sight of the headquarters of the Bureau of Animal Industry at Washington, and with the Zoological Division constantly studying the parasites of Maryland livestock, very little has ever been done in an active and direct way by the bureau specifically to control livestock parasites in Maryland, and no large-scale campaigns for parasite control have been carried on in Maryland by the bureau. The bureau has carried on control campaigns against swine parasites in the Middle West and parts of the South; it has aided in control campaigns against horse parasites in the Middle West; it has carried on control campaigns against sheep liver flukes in the West; it has carried on control campaigns against ox warbles in the Middle West and West; it has carried on control campaigns against sheep parasites in the Middle West; but it has done nothing of the sort in Maryland.

Why this apparent neglect of a State lying next door to the National Capitol and with the abundance of its parasites clearly evident for almost half a century? The answer is mostly to the effect that Maryland is one of the many States that have made no demand for work of this sort. When a State or a section of the United States becomes worried about its losses from parasites and demands assistance, the bureau takes this as evidence that there is an aroused interest in that place and that there is a prospect of co-operation. When the bureau is invited to do some-

thing, there is no suspicion that the bureau is trying to force a program on a group of persons who are not interested and who do not want it. This is a matter of importance at this time when certain groups in the United States are applying the term bureaucrat to all Federal employees, and intimating that the only reasons why Federal employees engage in any activity are to get more Government money to spend, to build up larger organizations in order to enhance their own importance, and to interfere with the business man in the pursuit of his business. It is useless to say to such persons that Uncle Sam is exceedingly fussy about Government money, that he guards his expenditures with a network of red tape, such as business houses do not know, to prevent the spending of that money for any but legitimate purposes, that a larger budget is a responsibility that must be, and is, taken seriously, that a larger personnel adds to the work and grief of an administrator, but adds little or nothing to his salary or his reputation, and that the Government extends its assistance eagerly when it is requested, but is very shy about forcing its services on anyone who does not ask for them. When stockmen, farmers, packers, tanners and others interested in livestock ask for aid, the Federal Bureau of Animal Industry extends that aid whenever funds and personnel permit, and does it for the benefit of the livestock industry. In fact, the bureau exists primarily for the benefit of the livestock industry, and its chief objective is to aid that industry, to control and eradicate disease, and to assist in producing better and healthier livestock at less cost to the producer. As an employee of that bureau I have a pride in its record, and that pride is justified by what that record shows in substantial benefits to the livestock industry and the people of the United States, far exceeding in value all that the people have paid for the maintenance of the bureau.

As matters stand, and assuming for the moment that Maryland stockmen are interested in the control of parasites of livestock in Maryland, what can be done about it?

There are two possible broad lines of conduct. One is for the individual stockman to ask for help from the bureau or from the State authorities, and this help will be forthcoming in the way of information and advice. Progressive stockmen quite generally ask for this sort of help and receive it. It has considerable value and some limitations. One of the limitations is that certain parasites cannot well be controlled unless control measures are carried out on a large scale, so that the progressive stockman does not find his stock promptly reinfected from his neighbor's parasitized stock. Thus if one stockman treats his horses for bots and his neighbors do not, the bot flies from his neighbors' farms will see to it that his horses have bots the next year.

Large-scale campaigns have much more value. They arouse interest and permit of bringing information directly to large numbers of persons at the least expense. Only when there is something special to investigate can the bureau afford to send a man to one farm, but it can send a man to lecture at a meeting where many stockmen are present. I am speaking now of normal times; at the present time the restrictions on travel by Federal employees make it almost impossible, as a rule, to attend meetings at Government expense, and the Federal employee, however public-minded, is not in a position to finance too much Government work at his own expense, although he usually does more or less of this. Another advantage of large-scale campaigns is that they afford the protection mentioned above from parasites harbored by the livestock of neighbors who would not use control measures except under the conditions of such campaigns. Another advantage is that such campaigns often reduce the expense of control. In the horse parasite control campaigns in Iowa and Illinois, farmers in a given area agree to have their horses ready for treatment on a certain day, so that the veterinarian can treat them all on that day. By virtue of this arrangement the veterinarian can make a very low charge for his services,

since he can cut down the overhead charge in travel and other items very materially, as compared with the charge for making special trips back and forth to treat a few animals.

Regardless of whether small-scale or large-scale control measures are used, control for parasites is of two sorts—treatment and prevention. When we deal with such parasites as the common sheep stomach worm, *Haemonchus contortus,* we are dealing with a parasite which breeds rapidily under such favorable conditions as are present most of the year in Maryland, and which build up heavy infestations very rapidly in animals which soil their table, the pasture, with manure containing the parasite eggs, and which crop closely the food on that table. Pasture rotation to control these worms would call for moving sheep at least once every three weeks and leaving the pasture fallow for a year, and the expense in land and fences necessary to do this makes the procedure prohibitive. Any pasture rotation whatever helps, but for control one must depend on medicinal treatment. Sheep may need to be treated once every two to four weeks, at least from early spring through fall, the frequency depending on the degree of stocking, climatic conditions and other things.

On the other hand, the control of swine ascarids and some other swine parasites is best accomplished by the preventive measure known as the swine sanitation system. Even here, medicinal treatment to remove ascarids is sometimes of value, but in general a strict adherence to the sanitation system gives the best results.

How might small-scale and large-scale control measures in the way of treatment and prevention be applied to Maryland's problems of parasitism in livestock? Taking up the more important of these problems by livestock groups, general recommendations may be laid down as follows:

HORSE PARASITES

Ascarids, bots and *stomach worms.* These are best attacked as part of a large-scale campaign for the control of horse parasites. As carried out in Iowa and Illinois, this program is a program of treatment by veterinarians under co-operative arrangements involving veterinarians, the State entomologist, county agents and other extension agencies, and the stockmen and farmers. Agreements and plans are drawn up by all these agencies, meetings are held to secure co-operation, all horses in a given area are ready for treatment on a certain day, and the veterinarians treat these animals for a fixed sum, 40 to 50 cents a head. The results of these campaigns in Iowa and Illinois have been very satisfactory to the stockmen and farmers. The treatment used is highly effective in removing ascarids, bots and some stomach worms, and the big majority of stockmen and farmers report that their horses do their work very much better, are free from colic or have very much less colic, and gain in weight and condition.

General sanitation, especially in the form of suitable and prompt disposal of manure, is of great value as an aid in the control of these parasites. This is a matter for the attention of the individual stockman and farmer.

Blood worms, cylicostomes and *pinworms.* These worms should be controlled by a large-scale control campaign similar to the one outlined above, but using a different drug for treatment. The advantage would in the way of diminished cost. Since the bot is not involved here as a complication calling for large-scale operations to prevent reinfection from untreated neighboring stock, it is of less importance that treatment be general over an area, and the benefit in the way of improvement in the condition of horses would be almost as great if an individual stockman had his horses treated, since the worm parasites do not move about so readily as do the bot flies. I know of one case in Maryland in which a farmer complained to a veterinarian

that his horses could not stand an hour's plowing in summer. The veterinarian treated them for blood worms, cylicostomes and pinworms, and the animals promptly built up in condition and were able to do a day's work.

External parasites. Lice and mites should be eradicated by such repeated treatments, used in a dipping vat or applied by hand, as are necessary. Lice become more troublesome in winter at a time when treatment is much more difficult than at other seasons, and animals should be freed of lice in the fall in order to avoid trouble in the winter.

CATTLE PARASITES

Unfortunately, we are not well supplied with control measures for cattle parasites. It has been difficult to find drugs that would remove parasites as effectively as we wish to remove them. Preventive measures have received little test for the reason that cattle are expensive experiment animals and the requirements in land, equipment and feed are expensive. In general we recommend: Keep calves on the dryest, safest pastures and away from older animals other than the mothers, and especially away from pastures having a history of lung worm infestation on them; clean the stables frequently and dispose of the manure by plowing under, preferably on areas where cattle are not pastured, or use the self-heating manure box to destroy parasite eggs and larvae by heat; and rotate pastures and stock in such a way that cows, horses and swine may be alternated whenever possible.

Ox warbles. Ox warbles, like bots, constitute a special case calling for large-scale action if the stockmen is to benefit. The warbles may be removed by hand or with forceps, or destroyed by the application of insecticides, but unless this is done over a large area, the warble flies from surrounding farms will renew the infestation the next year. As yet the Bureau of Animal Industry has not pushed campaigns to control ox warbles except in areas where the

work was being done as an experimental procedure to ascertain the best way of doing it. One of the evident difficulties in the way of control campaigns is the fact that the stockman who removes warbles must do so purely on the basis of benefit in the condition of the animal, but not on the basis of a differential in price of hides free from warbles over hides which are grubby. At present the packer buys cattle without reference, as a rule, to whether the animals are free from grubs or are grubby, deducting the average loss sustained as a result of grubs in hides from the price paid for all animals. If clean cattle, free from grubs, commanded a premium on the market over grubby cattle, there would be more inducement for removing grubs and a much better prospect for large-scale control campaigns.

SHEEP PARASITES

Stomach worm. No sheepman in Maryland can afford to ignore the stomach worm. It is commonly present in most Maryland sheep and often present in large numbers. It is destructive of profit and deadly to lambs. As already mentioned, it is best controlled by repeated treatments at two- to four-week intervals. Light stocking, pasture and stock rotation, sanitation around the barns, and similar measures aid in its control.

Hookworm. Hookworms are not so easily removed as are stomach worms, but repeated treatments with suitable drugs, together with such preventive measures as were given for stomach worms, will control them.

Nodular worms. Nodular worms are difficult to remove by medicinal treatments. One control measure is the use of the bare-lot method. Lambs are kept in a lot from which all vegetation has been removed, and are fed from raised feed racks and provided with clean water. The ewes are allowed in this enclosure only as often and for as long as is necessary to allow the lambs to nurse, and are then re-

moved. This method gives a large measure of protection to lambs at the time they most need it.

Lung worms. Maryland sheep have two kinds of lung worms. One of these has a direct life history in which no intermediate host is necessary, the infective larvae being picked up on pasture and developing to lung worms after migrating through the body to the lungs. In the case of this lung worm it is advisable to avoid pastures on which sheep have suffered from lung worms, or at least to keep lambs off these pastures, since young animals are more susceptible to parasitism and its bad effects than are older animals, as a rule. Pasture and stock rotation are also advisable.

In the case of the other sheep lung worm, the worm utilizes land snails as intermediate hosts. Sheep either eat snails accidentally or deliberately. We have very little direct information as to deliberate eating of snails by sheep, but it is a possibility. There is ample evidence that when livestock lack minerals essential to their welfare, they have a tendency to develop a depraved appetite manifested in eating bones and similar things. Possibly it will be found that this lung worm is prevalent in areas where the soil is poor in calcium and the lack of calcium is not made good by the use of minerals in the feed or in licks of some sort. For the time being it is good practice to see that sheep are supplied with plenty of calcium, not only to diminish the likelihood that they will eat snails, but also for many other good reasons. The measures recommended for the control of the other lung worm are also advisable. Finally, one might undertake to destroy land snails by spraying pastures with a one per cent solution of copper sulphate, but the value of this procedure has not been tested in connection with destroying land snails to control lung worms.

Grub in the head. The grubs in the heads of sheep are associated with what the sheepman calls snotty nose, and are often very troublesome. The only control measure

which has been generally recommended is the application of pine tar to the nose of the sheep to prevent the fly from depositing its larvae in the nostrils. The procedure has some value, but needs considerably more investigation to make it a practical and satisfactory control measure.

Sheep ticks. Sheep ticks should be eradicated by dipping.

Sheep scab. Sheep scab should be reported to the State veterinarian, who will take the necessary measures to see that it is cleaned out. For your own sake and for the sake of your sheep industry, you cannot afford to temporize with this disease.

GOAT PARASITES

Control measures for goat parasites are substantially the same as for sheep parasites.

SWINE PARASITES

The most important of the control measures for internal parasites of swine is the swine sanitation system, a quite simple thing. In spring farrowing, at a time when cold weather prevails, the farrowing houses should be thoroughly cleaned with boiling water, soap and lye to rid them of worm eggs. The sows are washed just before farrowing time to remove the mud which might contain worm eggs, and are put in the clean farrowing pens. In about ten days the sow and her young pigs are hauled, not driven, to a field sown in advance to a forage crop and provided with clean water, and are kept there until the young pigs are about four months old. In this way the young pigs are born in clean surroundings, raised in clean surroundings, and kept away from older infected animals other than the mothers. The forage crop takes care of many desirable food requirements. The fall farrowing in warm weather may be carried out in the field, and in the South all farrowing may be carried out in the field, the movable A-type shelter house being used in these cases.

This system accomplishes many things. For one thing, sanitation is the nearest thing we have to a panacea for preventing disease. The system was devised to prevent losses from the large ascarids or round-worms of swine. In addition it is a control measure for lung worms, since swine lung worms use earth worms as intermediate hosts, and the earth worms which serve best as intermediate hosts are those found in manure piles and in areas heavily contaminated with manure, and not those found on pastures. It is one of the very best control measures for trichinosis. Swine get trichinae from eating trichinous rats, from eating carcasses of trichinous swine, and from eating swill and garbage containing trichinous pork scraps. Under the swine sanitation system, swine will have little or no opportunity to eat rats, since rats will remain around the corn cribs and other outbuildings, and will rarely go on the pastures. Any swine breeder who has intelligence and energy enough to follow the swine sanitation system will not leave the carcasses of dead swine lying around his fields. Finally, the swine raised under the swine sanitation system will not be fed on swill and garbage. If you use this system you will protect yourself, your family and your friends from the danger of trichinosis to a very large extent. This danger is a very real one. One of the recurring tragedies in this country which comes to our attention every year, and has come to it this year as usual, is in the form of a story about a farm family that had a fall hog-killing, made some home-made sausage, had a big family party, and subsequently had trichinosis with the deaths of some or all of the persons at the party. Thorough cooking of sausage, avoiding the tasting of raw sausage to see if it is seasoned properly, and the use of the swine sanitation system are all measures of protection against this deadly disease.

Kidney worms. The kidney worms are best controlled by a modification of the swine sanitation system, under which the hog houses are in an area at one side of the field, from which area all vegetation is removed in order that most of

the urine, with its worm eggs, will be passed on unshaded soil where sunlight will destroy the worm eggs. The sow should have a separate feeding pen in this area and the little pigs should have their feeding pen on the forage crop area.

Hog lice. Hog lice should be cleaned up by dipping, hand treating or some similar measure.

CHICKEN PARASITES

Chicken tapeworms. Chicken tapeworms use a large variety of intermediate hosts, including land snails, earthworms, beetles and flies. It is a difficult matter to control or destroy all these intermediate hosts, but it is possible to control infection to a large extent by properly disposing of the droppings from the chicken houses. These may be plowed under on areas remote from where chickens are kept, or may be put in containers where self-heating will destroy the worm eggs. The houses should be cleaned often and thoroughly in order that intermediate hosts entering the houses may not become infected and later infect poultry. Medicinal treatment is not very satisfactory, for the reason that we have no drugs which remove these worms as dependably as we desire, and sanitation, rotation of yards, and similar measures must be depended on to a large extent for control of tapeworms.

Chicken ascarids. The large roundworm of the small intestine of chickens is amenable to medicinal treatment, and treatment is a valuable aid in control. Sanitation, especially as regards disposal of droppings, is also of value.

Cecal worms. Cecal worms are most amenable to treatment by rectal injection of drugs. Sanitation is of value. These worms are of great importance, for the reason that in addition to other injuries inflicted they transmit blackhead to chickens and turkeys. In this connection chickens and turkeys should be kept separate and away from areas ranged by each other. Chickens appear to be the normal hosts of

the blackhead organism, and by virtue of long adaptation they tolerate the organism much better than do turkeys. On the other hand, turkeys appear to be the normal hosts of the gapeworm, and tolerate it at all ages much better than do young chicks.

Gapeworms. Adult chickens are very resistant to gapeworms, and can hardly be infected with this worm. However, chicks are susceptible and are very commonly killed by gapeworms. As already noted, the combination of chickens and turkeys on the same area is not a good one. Chickens carry the blackhead organism and transmit it to turkeys, and it commonly kills turkeys. Gapeworm infection may be acquired by birds in picking up infective gapeworm eggs, but the eggs may also infect earthworms, and the young gapeworms may live for long periods in earthworms and infect birds that swallow the earthworms. Gapeworm cases should be segregated and their droppings disposed of in some way which will kill the worm eggs or keep them from coming back to birds or getting into earthworms.

Other nematodes. Many other nematodes of chickens use beetles, grasshoppers and sow bugs or pill bugs as intermediate hosts. Since control of these intermediate hosts is a very difficult matter, sanitation, especially as regards the disposal of the droppings, is the indicated control measure. Some other nematodes of chickens have a direct life history, and here again sanitation is the only known control measure.

Chicken lice. Chicken lice are readily controlled by the use of sodium fluoride and other drugs, and these should be used as needed.

Chicken mites. Chicken mites feed on birds at night and retire to cracks in the day. They should be attacked by the thorough application of suitable insecticides, such as carbolineum, to the hen houses, roosts, etc.

Turkey parasites. The control measures for turkey parasites are similar, in general, to those for chicken parasites.

SUMMARY

At the present time the situation as regards parasites of livestock in Maryland is as follows: Livestock in Maryland has almost all of the parasites known from livestock in the United States, including many that are known to be highly injurious in producing unthrifty animals, in diminishing the production of meat, wool, hides and milk, and in causing death. As a result of their activities much of your investment in good breeding stock, in soundly selected feeds, and in time and labor is lost. Comparatively little has been done or is being done in a systematic manner to control these parasites. Comparatively little will be done to control them unless you are convinced that they are injurious and that you want something done.

It is the business of the Federal Government to find ways and means of controlling parasites, to supply that information through the usual channels of publicity and on request, and to take an active part in control whenever funds and personnel permit and the demand for such action is made. It is the business of the stockman to take cognizance of such control measures as are known and to request assistance when he needs it. This is a statement covering only the relationships of the stockman and the Federal Government. Aside from these relationships there are others which should be mentioned. Your State officials are likewise available as sources of information and agencies for assisting you. The practicing veterinarian is an agency that should not be neglected, and is ordinarily the first person to whom you should turn for assistance; it is part of his business to know what control measures are available, and he is the person best fitted to administer medicinal treatment for the removal of parasites. When your problems are such that you wish large-scale control measures, all these agencies should be enlisted.

From the standpoint of the parasitologist, the following things should be done in Maryland: In addition to indi-

vidual control measures in the form of prophylaxis against parasites by stockmen and medicinal treatment by veterinarians, Maryland should have large-scale control campaigns against horse parasites and should use the swine sanitation system to control swine parasites. These are the two most important things to be recommended at this time. After something is done along these lines, it will be time to consider other possibilities.

Question: What is the cost per horse for treatment as given in these neighborhood or community projects?

DR. HALL: In Illinois the cost, at first, was 50 cents a horse. As a result of the depression, the price was cut to 40 cents a horse. Now they are contemplating charging 35 cents per head. Recently, a system has been arranged in Illinois whereby the veterinarian is being paid in products of one sort or another. If a man's horses are suffering from parasites and are treated, the profit is obvious, but if they are suffering from something else and are treated for parasites, they of course are not going to get any benefit. Horses are quite a "menagerie" when it comes to parasites. The number that horses can harbor is enormous. Since nearly all horses have parasites and seem for the most part to be up and about, one can get the wrong impression that parasites do not do much damage.

Question: Is there an occasional loss of a horse from bot-fly treatment?

DR. HALL: The only danger is from the drug used, and there you have the question of skill in administration. Animals were treated in Illinois with almost no loss. Usually the veterinarian can give capsules without any loss. At first there was some loss, but they found that the use of old capsules caused death; they had become brittle and would break in the mouth.

Question: Is there any effective treatment of sheep for grub in the head?

DR. HALL: Use has been made of an injection of carbon disulphide in the nostrils. Some apply pine tar to the noses. If you have only a few sheep you can take a brush and apply it, but with a large number of sheep, you can make holes in a board above the salt trough with tar placed around the holes so the sheep will apply it when they get salt. In the course of two or three days, however, the tar gets hard and dry and full of dust. We didn't find that it amounted to much. Once it is dry and dusty it is not much good.

Question: Is there anything to do about the grub after it has entered the head?

DR. HALL: Some of the grubs enter the sinuses through the nostril, and some of them die there. When they die you get the most trouble from snotty nose. It is difficult to get to the sinus, as it calls for an operation. We do not yet have measures to control it entirely.

CHAIRMAN JONES: Next we will hear from Dr. Mark Welsh, who will report on Maryland Hog Cholera Control Work. This is a subject in which swine growers of Maryland are interested, and we are always glad to hear from Doctor Welsh.

MARYLAND HOG CHOLERA CONTROL WORK

By DR. MARK WELSH,

Inspector in Charge of Hog Cholera Control Work,
College Park, Maryland.

It would perhaps be fitting and proper that we designate 1933 as a centennial year, commemorating hog cholera. This disease apparently made its appearance in the Ohio Valley in 1833, and is still demonstrating unusual vim, vigor, and vitality in cutting down the available supply of hams, pork chops, and chittlin's. Innumerable drugs have been used as cures or preventives, such as mercury in various forms, creosol and phenol preparations, intra-venous injections of

modern dyes having antiseptic value, and innumerable secret preparations that were supposed to act as a panacea. Aromatic oils have been put in the feed, and the pungent odor retained by a freshly killed skunk hide nailed to the door of the hog house has proved ineffective. About 1908, methods were given to the public by which a passive, or temporary immunity could be conferred on hogs with anti-hog cholera serum, and active immunity could be established when the serum and virus were properly given as a simultaneous treatment. Yet, strange as it seems, although hog cholera has been known for 100 years, and innumerable experiments and treatments have been devised, the infection continues to be the most important swine disease in this country.

There is today, no large area where hogs are extensively raised, that is entirely free of hog cholera, and there is no country, so far as we are able to learn, that, once invaded, has succeeded in freeing itself of the disease. It is true, since the advent of immunizing agencies, that few widespread epizootics have occurred. We have been successful in eradicating or controlling a large number of diseases that basically offer probably no greater resistance than hog cholera. Among these, of course, are foot and mouth disease, contagious pleuro-pneumonia, Texas cattle fever, glanders, and several others. More recently, apparently successful steps have been taken to control bovine tuberculosis, infectious abortion, baccillary white diarrhea of chickens, and others. If you will think over this list, you will find that the general procedures have been essentially the same. It was a question of determining how the disease was spread, and then interfering with the mode of spread by isolation, or destruction of the spreading animal and the institution of sanitary procedure that would tend to prevent dissemination. The treatment of an individual animal with drugs or biologics has seldom, if ever, proved an important factor in widespread eradication programs. Preventive procedures, by sanitary practices, have invariably been most important in eradication programs.

Experimental results and practical field work indicate that the virus of cholera rapidly disappears from the premises. Putrefactive processes apparently play a major part in the destruction of the virus in the refuse of the hog lot. This, of course, will vary with the season of the year. In the individual animal, the disease soon terminates, for the virus will destroy or immunize its host in a few weeks.

Apparently three systems might be employed to control this disease. 1. Every hog born should be actively immunized with serum and virus, or 2. The use of virus in immunizing procedures should be entirely prohibited, or 3. A compromise between the above two plans should be adopted.

We produce in this country about one hundred million hogs each year. We have approximately ten thousand veterinarians in practice. It is likely that there are probably too few men to carry on this work to make universal vaccination a practical program. At present, there is being manufactured sufficient serum and virus to double treat about one-quarter of the hogs in the country. It has been estimated that double treatment of all hogs in the country would cost approximately $50,000,000 a year—a prohibitive price.

For a number of years Canada has prohibited the use of virus within the Dominion. When cholera occurs, all hogs on the premises are destroyed, and the owner is indemnified for approximately three-quarters of their value. Those in the neighborhood are serum treated and a quarantine is put on the area for as long as seems necessary. The average annual cost for carrying on this work appears to be less than $50,000 a year. The Canadian plan has proved highly successful under their conditions. It is a debatable question whether it would prove as fully effective in the United States.

The Maryland plan for the control of hog cholera is essentially a sanitary program for the prevention of the introduc-

tion, harboring, and spread of the virus of hog cholera. It does not deny anyone the right to use the serum-virus method of treatment, if it is carried out in accordance with State regulations. We believe that limiting the use of hog cholera virus to the hands of those qualified to use it promotes the best interest of the swine producers. In those States where this treatment may be used by anyone, regardless of his appreciation of the danger involved in the use of virulent virus, it has frequently resulted in a spread, rather than a curtailment, of the disease. The program used in this State for hog cholera control is undoubtedly curtailing the number and extent of outbreaks. Since June of 1918, detailed records have been kept on every outbreak of hog cholera that has come to our attention. It is probably the most comprehensive field data available on the subject in this country. I shall not attempt to impose on you all of this statistical information we have accumulated, but I do believe that a survey of the past five years would be of interest. You will note from Chart I that infected pork in kitchen refuse, as represented by table scraps, and garbage, accounts for 83.9 per cent of the outbreaks, and that the movement of live, sick hogs accounts for 10.3 per cent. Approximately 94 per cent of all outbreaks were due then to hog cholera virus disseminated by either live hogs or dead hogs. In carefully controlled experiments Dr. Dorset of the United States Department of Agriculture found that the virus of cholera was not as readily spread by mechanical means as had previously been thought. Although it was found that men could carry the virus on their shoes and clothing, pigeons, on their feet, and rats, on their bodies, this type of spread was both uncertain and apparently infrequent. Our results here indicate that under practical field conditions, cholera is not commonly spread by agents other than hogs. This is not surprising when it is remembered that so far as we know, cholera is a disease of hogs and hogs only, and no other animal has been known to contract it. The virus grows only in a live hog, and either rapidly kills or immunizes the animal. Also, the virus

seems to be readily killed by the natural forces of nature under most conditions. It seems apparent then, that our efforts should be aimed at preventing primary outbreaks, which in the majority of cases, are caused by improper feeding, or improper management. Secondary outbreaks, or spread of the disease, are dependent upon primary centers. For the past five years, only approximately 5 per cent of our outbreaks have been secondary, or due to spread from a primary center.

The reduction in the deaths from hog cholera is best shown by the Chart II. To correct individual differences, the results are grouped by four year averages. Losses in the period 1913-16, before this work was started, amounted to 7 hogs per 1,000. In 1917-20, the losses were reduced to 51 per 1,000; in 1921-24, to 39; in 1925-28, to 23; in 1929-31, 18 hogs per 1,000. There is an apparent saving now of 50 hogs per 1,000 that were previously lost by cholera.

It is a pleasure to be able to report that in the year just completed, we had only 272 outbreaks of hog cholera in the entire State. This is next to the lowest number recorded in the 14 years for which we have kept records. This past year, many more people raised hogs for their home consumption than in the past. Many of these were people who had little or no experience in swine production. In the past, this group of new producers have caused a considerable number of outbreaks. This group were high this year in proportion to their numbers; however, prompt action lessened the usual spread from such sources.

Of the 272 outbreaks, 248, or 91 per cent were primary, or new cases. Eighteen, or 6.6 per cent, were secondary, or a spread from primary centers, and 6, or approximately 2 per cent, were of undetermined origin. Infected pork scraps in the kitchen refuse caused approximately 80 per cent of the outbreaks. The introduction of new stock caused about 9 per cent of the cases. Therefore, as usual, about 90 per cent of the outbreaks are obviously preventable by anyone using reasonable care in feeding, and in the purchase of new

stock. Two hundred and nine of these outbreaks occurred where hogs are kept under backyard conditions, that is, a small pen or lot, and 60 occurred on farms where hogs are bred and raised.

As usual, those counties adjacent to large cities recorded the greatest number of outbreaks. This is apparently due to two factors. First, the large number of people who are keeping a few hogs in the back lot under unsanitary conditions, and second, to those who are hauling raw garbage from the city to large numbers of hogs as a hog feed. In those counties where a large percentage of the population is engaged in farming, fewer outbreaks of cholera occurred than usual.

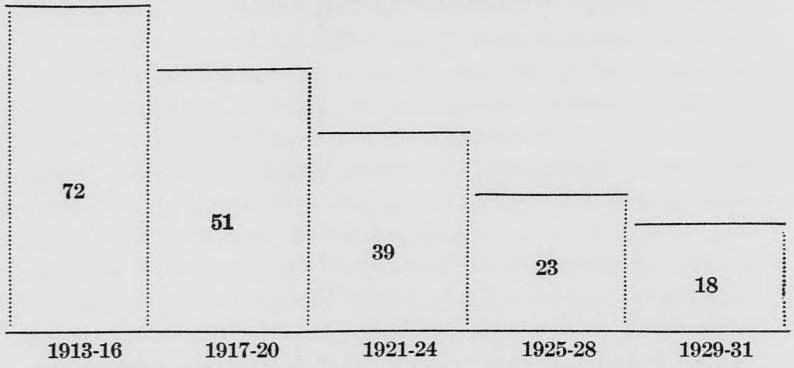
It becomes increasingly evident that the Maryland plan for the control of hog cholera is proving practical, economical, and offers means by which the disease can be controlled, and eventually eradicated. In this regard, we are apparently far ahead of other States. The results that have been accomplished in the past 14 years have been, and could be accomplished only through the co-operation of the live stock producers, the Maryland Live Stock Sanitary Service, and the Federal Bureau of Animal Industry, and I wish to thank those of you who have co-operated with us. There is, however much to be accomplished before hog cholera can be eradicated, although the machinery for bringing this about exists at the present time. Three channels are still open to widespread epidemic of cholera. One, the free movement of cholera-infected hogs within a State and across State lines, is still to be controlled. Two, the entrance of cholera-exposed hogs into the channels of trade as dressed meat, is a major factor in the dissemination of the virus. Three, the unrestricted use of virus in treatment procedures is apparently a common source of infection in many States. Until these sources of infection are controlled, the fight against cholera will have to be continued by all of those who are interested either in swine production or the control of infectious disease.

CHART I.

CAUSES	OUTBREAKS		EXPOSED HOGS	
	Number	Per Cent Total Outbreaks	Number	Total Per Cent
Table scraps	1,886	70.5	20,233	42.6
Garbage	359	13.4	16,001	33.7
New stock	147	5.4	3,044	6.4
Loose hogs	130	4.9	2,437	5.1
Unknown	105	3.9	3,359	7.1
Unburied carcasses	21	0.8	721	1.4
Infected premises	13	0.5	390	0.8
Double treatment	10	0.4	1,030	2.2
Dead hogs in stream	3	0.1	221	0.5
Virus on person	2	0.07	45	0.1
Infected truck	1	0.03	45	0.1
Total	2,677	100.0	47,526	100.0

CHART II.

CHART SHOWING HOG CHOLERA DEATHS PER 1,000 HOG POPULATION DURING YEARS 1913-31—GROUPED BY FOUR-YEAR AVERAGES



Question: Is there any danger of bringing a double-treated hog into your herd that has been treated for two months?

DR. WELSH: I should think not. Usually double-treated animals do not bring cholera into the herds.

Question: Do regulations call for 30 days to elapse after the double-treatment before bringing the animal into a clean herd?

DR. WELSH: Yes, to play on the safe side.

Question: What about the safety of bringing a single-treated hog to your farm when it is to be given double treatment later on? Is it likely to be safe to buy single-treated hogs with the assurance that double treatment will take?

DR. WELSH: I should think it would be perfectly safe.

Question: After single treatment could you double treat within two or three weeks?

DR. WELSH: I think it better to wait for a month.

A nominating committee was named by Chairman Jones consisting of Mr. W. R. Harvey, Jr., of Baltimore County; Mr. J. Herbert Snyder, of Carroll County; and Mr. Osborne Stabler, of Montgomery County, to nominate officers for the Association for 1933.

Announcement was made concerning headquarters room in the Lord Baltimore Hotel and the dinner meeting at 5.30 Thursday evening.

WEDNESDAY EVENING SESSION

The Wednesday evening dinner meeting session was held at Miller Bros. Restaurant, Baltimore. President Humphrey D. Wolfe of Howard County presided and acted as toastmaster. Senator Wolfe read communications from Governor Albert C. Ritchie and from Mayor Howard W. Jackson, expressing their regret at being unable to attend the meeting. Before proceeding with the program, Senator Wolfe called attention to the fact that three generations of one family were present, former president of the Maryland Stockmen's Association, W. R. Harvey; his son, W. R. Harvey, Jr.; and his grandson, W. R. Harvey, III, all of Baltimore County. Inquiry developed the fact that no other family had such a representation at the meeting, though there were four instances of father and son being present. These were as follows: John R. Iager and Maurice Iager of Howard

County; Joseph Mattingly and his sons J. Maguire and John S. Mattingly, all of St. Mary's County; Joseph W. Shirley and Joseph Whitney Shirley, Jr., of Baltimore County; and James M. Snyder and J. Herbert Snyder of Carroll County.

PRESIDENT WOLFE: Professor F. L. Bentley, of State College, Pennsylvania, will now discuss "Some Recent Trends in Beef Production." I am sure that we shall be much interested in what Mr. Bentley will have to say.

SOME RECENT TRENDS IN BEEF PRODUCTION

By PROF. F. L. BENTLEY,

Head Animal Husbandry Department, Pennsylvania State College, State College, Pa.

The United States produces beef and dairy products of greater value than any other country in the world. In the past we produced a considerable surplus of beef which was exported to the value of many millions of dollars each year. In recent years these exports have declined to a very marked degree, and probably will remain low for some time to come. In 1900 we exported 857,542,000 pounds of beef and 397,286 head of live cattle; in 1929 we exported only 101,334,000 pounds of beef and 7,531 head of live cattle. The imports of these products have been increasing: in 1900 we imported 2,500,000 pounds of beef, while in 1929 we imported 62,481,000 pounds.

The decline in beef exports may be accounted for in two ways: first, population increase, with the necessarily greater home consumption; and, second, lack of demand from importing countries, due to economic conditions and to competition from other surplus beef producing countries.

The beef cattle industry in the United States had its beginning late in the eighteenth century when the Eastern settlers pushed across the Allegheny Mountains and settled in the fertile Ohio River Valley. Here the early settlers

found an area of grass such as they had never dreamed of. East of the Alleghenies the production of beef was attended with more difficulties; the soil was not too fertile at best; grass did not flourish as it did west of the mountains, so there was little inducement for these eastern settlers to keep more cattle than were needed for work and to supply milk for the home. The earliest settlers, however, had brought cattle to the New World, but because of the abundance of wild game, beef was considered a by-product of animals kept for milk and work. The only qualification necessary for these cattle was their ability to work, and for this the long legs; lean, muscular bodies, and heavy heads and shoulders admirably adapted them. This same type of cattle was taken westward, and to a marked degree they are the progenitors of our present-day beef cattle.

Even with the unusual facilities that this new country west of the Alleghenies provided for beef production there was one very essential thing lacking, and that was a market for these cattle after they had been finished on a long feed of corn, hay, and native grass. The first medium of transportation to the seaboard markets was the overland trail. The beginning of trailing in America marks an important epoch in the development of the livestock industry in the United States. Michaux, in Thwait's "Early Western Travels," states that in 1802 drovers bought their cattle in Kentucky and drove them overland to Virginia, where they were fattened for the Baltimore and Philadelphia Markets. However, most authorities give George Renick credit for the first important adventure in cattle trailing. In 1805 he drove 68 cattle from the Scioto Valley in Ohio to Baltimore. Following this, thousands of cattle were driven east during the early part of the nineteenth century.

From Ohio the beef cattle industry moved westward, first into the Mississippi and Missouri River states and later into the semi-arid sections west of the one hundredth meridian. During the period of this westward expansion we find the business also developing in the great Southwest.

In 1820 Eastern colonists settled in Texas, near Austin, and engaged in cattle raising. The original cattle for this section came from Mexico and were of the old Spanish longhorn type. Cattle were driven from Texas to New Orleans for market. Inasmuch as the type of cattle was very inferior and the only fattening feed was grass, these cattle did not command the attention and price at the Eastern markets that cattle from the corn producing States did. Driving cattle northward from Texas did not assume very large proportions until after the Civil War, which had left a great surplus of cattle in Texas and a great scarcity in the North. With the outbreak of the Civil War all shipments of cattle from the Southwest were stopped. Consequently, the cattle business of that section suffered severely. Many herds were abandoned and even the best cattle could be bought for from $4.00 to $6.00 per head.

In the North, the Civil War had exercised a beneficial effect upon the cattle business. The general prosperity and the demand for beef by the Northern armies resulted in an increase in beef consumption, which brought about high prices and a period of subsequent prosperity among cattlemen. After the war, with depleted herds in the North and unlimited supplies in Texas and the Southwest, a flourishing cattle trade was started, and thousands of these longhorn cattle were driven into Missouri, Iowa, Illinois, and a few to Ohio, where they were fattened and sent to the Eastern markets.

While there had been a gradual distribution of cattle through the Central Western States immediately following the Civil War, it was not until after 1880 that the range industry began to assume large proportions. A vast area of grass land had been opened up west of the one hundredth meridian that could be used as free pasture, and the cattle business took on an activity before unheard of. Cattle from Texas were the main source of supply for the entire region. At first the grazing of steers was the principal business, but gradually breeding cattle were introduced and large herds

established, especially in the better grass-producing sections. With this source of supply for steers for Corn Belt feed lots, breeding herds were practically abandoned in the Corn Belt States, and the main industry was fattening.

In the early development of the range cattle industry very little thought was given to the quality of the cattle raised; it was numbers most sought after. However, with the product of these herds going into the Corn Belt for feeding it was soon realized that improvements were necessary. Among the first to introduce improved blood into this Western country were the Mormons, who had emigrated to Utah from Illinois in 1848. The introduction of improved blood into the Texas herds was found to be very difficult on account of Texas fever, and the improvement of herds in this section of the great Southwest was much slower. The use of high grade and purebred bulls in the range country resulted in a marked improvement in the type of cattle produced. This created a demand for purebred bulls, so that Corn Belt beef breeding changed from a commercial to a purebred business.

The cattle population of the range States increased rapidly during the eighties and reached the highest point in numbers in 1894. "Progress since that time must be measured in quality and productivity." By 1886 the herds had increased in many places to the point where the pasture available was sufficient only for summer grazing, and the cattle went into the winter without an adequate supply of feed. The winter of 1886 was very severe, and tens of thousands of cattle perished on the Northern ranges. This disaster crippled the business for many years, and the breeding of cattle in the North was practically abandoned. A similar fate hit the South in 1893, and these did a great deal to bring about changes in the methods of Western cattle raising. These experiences taught the value of providing adequate feed and shelter for winter maintenance. This necessitated the handling of cattle in smaller units, which could be best effected on smaller ranches. Since 1890

there has been a gradual breaking up of the big outfits in favor of smaller concerns that can give better care to their cattle.

Following this we find a marked change in Western cattle production. Not only were the cattle improved in type, winter losses reduced, and the pastures growing better, but it was also true that the range was carrying more cattle than formerly. Up to 1900 we find that the principal trend in beef production had been an increase in numbers, very little thought having been given to the improvement in type or the economy of production. While it no doubt would have been advantageous to these early cattle producers to give more thought to improving type, the matter of economy of production was not of any great consequence. The free grass on the range did not present any real problem of economy, while in the grain-producing areas livestock was the only market that farmers had for their grain crops. Because of these facts we find that the steer that could carry the most grain and hay to market was the popular type with the feeders.

Beginning about 1900 and continuing up to the present, we find many significant developments and trends in the beef cattle industry. With a rapid increase in population and a growing demand for food products, many discoveries were made that turned large quantities of grains into channels other than feed for livestock, thus increasing their value. About this time our agricultural experiment stations had discovered methods of feeding and of combining feeds so that much less grain was needed for fattening. As a result of these findings and those of experienced cattlemen we have seen many changes in the feeding and breeding of cattle in the past 25 years.

Because of the differences in adaptability, available feeds, and markets, the United States is usually divided into four principal beef producing areas: The Western range, the Appalachian and Great Lakes region, the Corn Belt, and the Cotton Belt.

The Western range is the great grazing area of the United States, and here we find the largest breeding herds for the production of feeder cattle. A very small percentage of cattle coming from this region are fat enough for slaughter purposes. There has been a trend, however, in recent years toward more fattening, and with present methods of beef production in other regions continuing and expanding it seems reasonable to think that more fattening may be done in this area.

In the Appalachian and Great Lakes region most of the cattle are produced on small farms. About one-third of this area is improved farm land. Most of the remaining land is too rough for cultivation, but when cleared makes excellent pasture. In the more productive sections cattle are wintered on hay, stover, and corn silage, and in many sections purebred and grade herds of breeding cows now are kept for baby beef production.

The Corn Belt is the principal cattle fattening area. Over 25 per cent of the corn crop is fed to cattle. While most of the land in this area is tillable, there is some land in each community which can be used for cattle pastures to advantage. In recent years many breeding herds for the production of baby beef have been established in this area. We also find many of the larger purebred herds in this section.

In the Cotton Belt proper relatively few cattle are maintained. Included in this area are sections that do not raise cotton, and in many of these sections cattle are handled much the same as on the Western range. The average quality of the cattle produced in this area is below that in other areas. However, with the control of the Texas fever tick, most sections have made material improvement in quality.

A more detailed study of these areas of beef production would show that this industry has centered largely in the Great Plains area, extending into the Rocky Mountain States and including all of the Western Corn Belt States. This concentration of surplus cattle far from the Eastern centers of consumption involves many economic problems

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in the marketing and distribution of this product to the consumer.

The production of beef cattle is very definitely divided into four phases: First, breeding and fattening baby beeves; second, producing stocker, feeder, and grass fat cattle; third, fattening thin cattle; fourth, breeding purebred cattle. The first two of these groups are more vitally concerned with the long-time changes in production and the general level of prices, while the third group is more concerned with season to season or short-time variations in market supplies and prices.

During the last 25 years there has been an increasing tendency to market cattle at younger ages and at lighter weights. The producer has found that a more rapid turnover is desirable from the standpoint of efficiency and economy. The consumer prefers smaller, more tender, and less wasty cuts of beef. Twenty-five years ago choice, heavy fat cattle always sold above light-weight cattle of comparable quality, but in recent years there has been an alternating tendency for first one weight group to sell at the top, then the other, depending upon the relative market supply of each group.

This system of production and marketing is considered by most authorities to be the most signficant and important development in the beef cattle industry during recent years. It has caused more changes in breeding practices, feeding methods, and in beef cattle distribution over the country than any other factor. It has brought about, and is still bringing about, the establishment of many small herds of cows of beef type on Corn Belt and Eastern farms. This system of production lends itself admirably to Eastern farm conditions and we find an increased interest in all sections of the East in this type of beef production. With the establishment of many small herds of beef type cattle throughout the North Atlantic States and the production of quality beef carcasses, it has been demonstrated that Eastern buyers are interested in this product. We have only to compare the

prices paid at our Eastern fat cattle shows with those of the Middle East and Western shows to demonstrate this fact. Practically without exception the Eastern sales have averaged higher. There is a definite trend toward increased interest in this type of beef production in the East, and if those interested will apply modern and approved methods to this kind of production, it can be made an important part of our Eastern agriculture.

The keeping of cattle is one of the foundation stones of diversified agriculture. The by-product of cattle raising is the secret of the permanent value of the herd. Cattle make possible the success of other branches of the farmer's business. Eastern tobacco growers have long recognized this fact. Lancaster County, Pennsylvania, is one of the richest agricultural counties in the United States, and its wealth is directly attributable to the persistence with which cattle feeding has been followed by owners of the land. Good buildings, a fertile soil, and satisfying results from general farm operations distinguish that prosperous community from others, where soil depleting methods feature the management. If you ask most any Lancaster County feeder whether his cattle feeding operations pay, he will say, "No, we do not depend upon making money directly on our cattle, but we can't make money without them."

The importance of beef cattle in the United States lies in their ability to convert large quantities of coarse feeds into foods for human consumption.

Many a herd has more than paid its way, and yet, through unfair accounting, has been charged with losing money.

Any summary of the accomplishments of cattle producers to date shows at least two important trends, namely that commercial market requirements play an important part in the producer's calculations, and that efficiency in production methods is vastly improving. Then, too, the food business is basic, and a meat diet is a basic part of the food wants of the American people. In spite of efforts on the part of some cereal manufacturers and others to divert consumption

from meats to their particular specialized products, there has been very little change in meat consumption. Steaks and roasts are just as popular today as they were 50 years ago, and will unquestionably retain this same popularity in the future.

PRESIDENT WOLFE: Tonight we have with us Mr. John A. Lomax, of Austin, Texas. Mr. Lomax has made quite a study of cow-boy ballads and the characteristic literature of the West as it was in years past. He will read some Western verse and will tell us something about Texas and Texas music. It is my pleasure to introduce Mr. Lomax to this group of Maryland stockmen.

Whereupon Mr. Lomax entertained the assemblage with story, verse, and song, and taught his listeners to join heartily in the chorus of one of his many-versed cowboy ballads.

PRESIDENT WOLFE: I am sorry to have to announce that Mr. Joseph P. Healy, of Swift and Company, is detained from being with us on account of an accident which resulted in a broken arm. Though we shall miss his genial personal presence, we are fortunate in having with us, as Mr. Healy's representative, one of his co-workers, Mr. L. T. Hewitt, of Swift and Company, who will now address us on "Some Important Developments in the Meat Trade."

In the absence of Mr. Healy, Mr. Hewitt then read the following statement and address which had been prepared by Mr. Healy:

"To the Members of the Stockmen's Association and their Friends:

"I regret very much my inability to be with you tonight, and I am asking Mr. Hewitt to read to you a few notes that I have made, and in addition to that—because of his contact with the buying public and the meat trade—to say something further to you.

(Signed) "JOSEPH P. HEALY."

SOME IMPORTANT DEVELOPMENTS IN THE MEAT TRADE

By MR. J. P. HEALY,

President, Baltimore Packers' Association.

To hold a post mortem of the past is a coroner's job, and I have no desire to act for any coroner. The year 1932 has passed, is behind us, and the new year calls us to action. None of us can spend too much time or thought upon what has passed; it has gone into history. Our thoughts and actions and concerns are with the present and particularly with the future, which we must soon meet.

It is my impression, and I honestly believe I am right, that the rank and file of the people and masses generally have become reconciled to these salient facts: back of 1915 we were in a normal period; from 1916 to 1929 we were in abnormal times; in 1930, 1931 and 1932 we were in subnormal times; and, beginning with 1933, we are back again to normal times. Everywhere I go, it seems to me that all but a few professionals and men in the executive classes, whether in industry or in banking, etc., have adjusted themselves to the present-day situation; they have added courage, and have been able, in the large part, to give a good account of themselves. There is, for a fact, a better situation in employment, and that is going to improve steadily. There seems no question but that the buying public from now on will be able to absorb even the increased production of livestock in sight.

In my judgment the packer is mostly interested, and should be, in improving the selling price situation, and doing it promptly and immediately in order that a higher price for livestock can be paid to the producer. We must all admit that livestock must be bought on the basis of what the killer is able to obtain for the meat and the by-products. When the prices on those products rise, the packer is will-

ing—and, even if he were not willing, he would be forced by competition or other packers—to pay higher prices for livestock. There is no question but that these lowered prices which have been so disastrous to the grower have had a definite effect on keeping meat products not only before the public, but within the buying power of their leaner pocketbooks. This has reacted in the total figures, which are available to show that the per capita consumption has increased in recent months.

I have no desire to let hope be the father of the thought, nor to see rainbows. I honestly believe, however, that the prices are now stabilized, and probably will continue at these levels until through July and August. After that, there should be better resale prices, and in turn higher livestock prices, first for hogs and then later for beef cattle. I do not believe that we will see much change or advance in livestock prices for the next six months; however, I do believe that stockmen or farmers who produce livestock would make a mistake if they permit the unsatisfactory and unprofitable situation that they have been through to cause them to reduce their livestock replacement and be without animals to sell in the fall of 1933 and the spring of 1934. In my judgment, livestock produced for marketing in that period will cost less to put it on the market than for many years, and will unquestionably bring a higher return than present price levels afford.

As president of the Baltimore Meat Packers' Association, let me tell you with much feeling and very deep sincerity that, while we have had our troubles in market decline of inventories (our particular grief), or readjusting our expenses, with headaches from lack of profit, nothing has been of deeper concern than the very low prices we have had to pay for your livestock.

We shall ever be on the lookout to do what we can for your better interests. The Baltimore packers still have courage. We are honestly hopeful for the future, and we promise you our best co-operation.

Mr. Hewitt then discussed in an interesting way his personal observations and experiences concerning the attitude of wholesale meat salesmen and retail meat dealers toward livestock and meat prices. He said in part:

"Speaking from experience as a packer's salesman, and observation of salesmen whom I have tried to help and manage, this fact is striking—the salesman's job is always easier, happier, and more profitable when meat prices are high. It is much more pleasant when buyers say, 'Save me a couple of good cattle' or 'Look out for me for ten hinds and ribs,' than when they say, as now, 'I'll have to wait a day or two to get some other fellows' prices' or 'No matter how cheap it is I can't seem to sell as much as I used to.' With the recent cheap meat prices and the consequent shading of prices to get trade, no salesman can be sure that he has a regular customer anymore.

"From my contacts with retail meat dealers, I know that the good business man, the solid, hard-working, conscientious dealer, never had a harder time to make a fair profit than through this time of cheap prices. These cheap prices have encouraged the opening of innumerable cut-rate stores that have made the old regulars (the men who know what it costs to do business, and what it takes to make a fair profit) weep for the good old days when they paid 20 cents a pound for cattle and could then cut a respectable profit from them.

"The time was, not so many years ago, when an enterprising man could open a retail meat business, pay the prices for his meat that made everybody a little profit from the livestock grower on down the line, and by hard work and attention to the unwritten rules that make for success, soon put it on a profitable basis. It takes a brave man, or an unknowing one, to attempt the same thing now, even though meats are selling ridiculously cheap."

Mr. Hewitt stated that in his opinion a substantial improvement in the livestock producers' position would be

reflected in better business and larger profits for packers and for retail meat dealers alike. He expressed the hope that real prosperity might soon return to the producers of meat animals throughout the country.

PRESIDENT WOLFE: The awarding of prizes in the Maryland 150-Day 1,500-Pound Litter Contest comes next, and will be in charge of Director T. B. Symons of the University of Maryland Extension Service.

Dr. T. B. Symons, University of Maryland Extension Service:

Mr. Chairman and Members of the Maryland Stockmen's Association:

I am glad to see such a large attendance at this annual meeting. It bespeaks a constantly increasing interest in the various phases of the livestock industry in the State. We have made notable progress during the past year, notwithstanding the depressed prices affecting the industry.

We all made strenuous efforts to put on the splendid Livestock Show last fall, and I want to extend my congratulations to Mr. W. R. Harvey and all associated with him for the wonderful success of the exhibition. The banquet meeting was one of the finest ever held in the history of the livestock interests of this State. I trust that we may be able to secure some permanent finances for the upbuilding of the exhibit so that we will not be in doubt from time to time concerning its success. Undoubtedly the show has served as a wonderful impetus to the livestock interests of the State.

I want to congratulate the hog raisers who have participated in the Maryland 150-Day 1,500-Pound Litter Contest during the past year. Undoubtedly this contest has been a wonderful incentive and demonstration as to how we can lower the cost of production. This is a problem that is presented to raisers of livestock as well as farm crops.

We must continually stress more efficient production, better grades and co-operative marketing.

I want again to express our appreciation to the Schluderberg-Kurdle Company for their generous prizes offered in the litter contest during this and past years.

I am pleased to announce the following winners for 1932.

Mr. William C. (Buck) Schluderberg gave the awards to the winning contestants as follows:

LITTERS THAT REACHED THE GOAL, AND PRIZES WON

Name	County	Weight of Litter at 150 Days, Pounds	Pigs in Litter	Prizes Won		
				State	County	Amount
John R. Iager	Howard	2,796	12	1	....	$40
Sterling H. Little	Carroll	1,990	11	2	....	30
J. Earle Marshall	Baltimore	1,702.5	10	3	....	20
Susquehanna Farms	St. Mary's	1,644	10	....	1	15
						$105

Mr. William C. (Buck) Schluderberg, who represented the William Schluderberg-T. J. Kurdle Company, presented the checks from this company that, as for some years past, were offered as prizes. This firm has most generously supported the litter contest by both money and active interest. Mr. Schluderberg spoke briefly concerning the participation of his firm in litter contest activities, and also earnestly advocated the careful selection of sale cattle for the auction held each year in connection with the Baltimore Livestock Show.

ENTRIES IN THE 1932 MARYLAND 150-DAY 1,500-POUND LITTER CONTEST

Owner	County	Pigs in Litter	Date Farrowed
J. Earle Marshall	Baltimore	10	May 19
Charles Ellwanger	Caroline	10	April 22
W. J. Martin & Son	Caroline	11	March 27
W. J. Martin & Son	Caroline	11	March 21
Clarence Kern	Caroline	10	March 8
Sterling H. Little	Carroll	11	April 24
C. A. Kuehnle	Dorchester	10	March 26
C. A. Kuehnle	Dorchester	9	March 26
John R. Iager	Howard	12	June 8
William J. Hines	Montgomery	11	April 29
Susquehanna Farms	St. Mary's	10	April 12

STATE CUP WINNERS IN MARYLAND LITTER CONTEST

Year	Name	No. of Pigs	Age Days	Weight Pounds
1925	Charles F. Hines	9	150	1,612.5
1926	G. Carlton Oland	12	150	2,423
1927	G. Carlton Oland	10	150	2,093
1928	Stanley P. Stabler	10	151	1,795
1929	J. S. & E. T. Cullen	13	151	2,161.5
1930	John R. Iager & Son	11	151	2,225
1931	John R. Iager & Son	11	150	2,563.5
1932	John R. Iager & Son	12	150	2,796

FIRST STATE PRIZE LITTER REPORT

By MAURICE IAGER,

Howard County.

Mr. Chairman and Gentlemen:

At the end of the eighth year of this contest, I am proud to claim the cup for Howard County, and hope the swine growers of Maryland appreciate what the sponsors of this trophy are doing for the hog industry of Maryland.

For the third time let me thank the Wm. Schluderberg-T. J. Kurdle Company for the State prize. I value this prize for its monetary value and also because I have been able to do my part for the hog-feeders of Maryland.

This litter of 12 pigs was farrowed by a grade Berkshire sow and sired by a pure-bred Poland-China boar. The 12 pigs and their mother consumed 6,200 pounds of concentrates, and 800 gallons of skim milk. My method of feeding, housing and grazing was the same as in previous years.

EXPENSES:

500 lbs. white and brown middlings	$ 7.50
400 lbs. red dog flour	6.00
600 lbs. commercial pig feed	12.00
200 lbs. fishmeal	4.00
2,400 lbs. ground wheat	26.00
2,100 lbs. corn	12.00
800 gals. skim milk	32.00
Blue grass pasture	6.00
Total feed cost	$105.50
Hauling	10.00
Total, feed and hauling	$115.50

RETURNS:	
2,796 lbs. live hogs @ 4.40c	$123.02
State prize	40.00
Total returns	$163.02
Balance	$47.52

Again, I thank you.

SECOND STATE PRIZE LITTER REPORT

By STERLING H. LITTLE,

Carroll County.

In making this brief report I want first to take the opportunity to express my appreciation to the donors of this prize, the Wm. Schluderberg-T. J. Kurdle Company, who have so generously sponsored this contest, not only during this year but the past several years.

This litter of 11 pigs was farrowed April 24, 1932, and while pigs farrowed at this late date are laboring under somewhat of a handicap, I decided to enter the contest.

The mother of this litter is a high grade, rugged Poland-China. They were sired by an equally good Poland-China boar.

I fed the sow according to my usual custom for the first few days, with some wet bran, changing her gradually to the following mixture: (Let me add here some of the feeds used were for the purpose of experimentation for my own personal satisfaction). As wheat was low in price I used a good deal of it in the ration.

FEED COST:	
Wheat—42 bushels @ 50c per bushel	$21.00
Corn—18 bushels@ 50c per bushel	9.00
Barley—24 bushels @ 35c per bushel	8.40
Fishmeal—100 pounds@ $2.50 per 100	2.50
Cottonseed meal—300 pounds @ $1.20 per 100	3.60
Tankage—300 pounds @ $1.50 per 100	4.50
Bonemeal—100 pounds @ $3.00 per 100	3.00
Limestone—100 pounds @ $1.00 per 100	1.00
Salt—100 pounds @ $1.00 per 100	1.00
Skimmilk—1,000 gallons @ 1½c per gallon	15.00
Grinding of grain	4.20
New ear corn—2 barrels @ $1.50 per barrel	3.00
Total cost of grain and minerals	$76.20

RECEIPTS:		
2,010 pounds live weight	$94.17	
Second State Prize	30.00	
Total receipts		$124.17
Less feed costs		76.20
Balance		$47.97

In conclusion I should like to add that there are several lessons that can be learned from a contest of this type.

1. Hogs as well as all other livestock respond to sane and sensible treatment.

2. Hogs should have a good environment, such as shade, pasture, and running water.

3. Feeds in the right combination are necessary for the profitable production of pork.

4. March and April pigs can be made to come on the market before the heavy run of hogs starts.

I am sure that a contest of this nature carries with it educational values that are worth a great deal. It also adds a spirit of enthusiasm that makes all worthwhile projects a success.

REPORT OF THIRD STATE PRIZE LITTER

By J. EARLE MARSHALL,

Baltimore County.

About a week before farrowing I cleaned and disinfected the farrowing pen, also washing the sow's udder with a disinfecting solution.

My sow received the following ration:

138 pounds corn meal.
40 pounds wheat middlings.
10 pounds fishmeal.
6 pounds oilmeal.
6 pounds ground alfalfa

After weaning the pigs they received the following ration in self-feeders:

400 pounds ground corn.
300 pounds ground oats.
200 pounds wheat middlings.
100 pounds fishmeal.

I kept them on this ration for about a month, after which they were put on a mixed oats and rape pasture with shelled corn and tankage in self-feeders. They also had access to the following mineral mixture: Equal parts of ground limestone, bonemeal, acid phosphate, and salt. The pigs had access to fresh water running through the pasture.

REPORT OF ST. MARY'S COUNTY FIRST PRIZE LITTER

By J. MAGUIRE MATTINGLY,

Manager, Susquehanna Farms.

For the first eight weeks the pigs were allowed to run with their mother. They had access to a creep where ground wheat, shelled corn, tankage and minerals were available.

After weaning they were fed from a self-feeder containing sweepings.* Corn was fed twice daily. Tankage and minerals were available, and the pigs had access to alfalfa pasture. I believe they would have fared better if they had better watering facilities. All water was carried to them in buckets.

PRESIDENT WOLFE: The question of efficient farm horses is one in which many farmers are interested this year. We are glad that Mr. J. O. Williams, who has charge of horse investigations conducted by the United States Department of Agriculture, is with us tonight. He will now discuss *The Present Farm Horse Situation.*

*Flour, wheat, bran and middlings damaged by rats and weather.

THE PRESENT FARM HORSE SITUATION

By J. O. WILLIAMS,

In Charge Horse Investigations,

United States Department of Agriculture.

When the World War ended there were approximately 27 million horses and mules on the farms and ranches of the United States. Today this number is about 17 million, the lowest number of work stock in this country for over forty years. The rate of decline has been greatest in our metropolitan areas where hard streets and highways, heavy traffic, and improved motor equipment have gradually shoved the horse-drawn vehicle off the streets. The rate of decline in numbers of work stock on farms has continued at about the same pace for several years. So far we have no indication that this rate has slowed down.

The price situation in relation to our work stock has also been very discouraging. The value per head of all horses on farms on January 1, 1932, was $53 compared with $60 last year, and was the lowest farm value for horses for 31 years; the farm value of mules this year was $60 compared with $69 last year, and was the lowest in 32 years. The total valuation of our work stock this year is 985 million dollars compared with 1,156 million last year.

But there is a cheerful tone in the reports of estimated prices received by producers since January 1 last year. Horse prices have started on an upswing. They averaged $56 for horses on January 15 last year and $59 on September 15. Prices for mules went up from $63 to $66 during the same period. This was an improvement in price of $3 per head for horses and $3 per head for mules for the same period. This improvement in farm prices for horses and mules is part of a change in the whole farm situation. For years many have been claiming that greater use of animal

power on farms will help bring farming back on an even keel by reducing cost expenditures and providing a market for surplus hay and grain, and at the same time utilizing power for which replacements can be produced on the farm. The events of the past year have justified a part of their preaching, at any rate. In a year when cash expenditures had to be cut to the bone, farmers turned to power that drew its fuel from the farm and required no cash outlay.

There is a definite shortage of good draft stallions being felt in many States. This statement is verified by a study of the data compiled by those States having stallion enrollment laws. These figures indicate that for the three-year period, 1929-31, the number of stallions enrolled for public service declined 14.2 per cent, while the number of jacks declined 29.5 per cent, and indications are that enrollments did not increase perceptibly during the past breeding season. This scarcity of stallions is accompanied by a decided shortage of young mares suitable for breeding purposes. Even with the incentive of stronger prices progress in producing replacements of our work stock will be very slow owing to the shortage of suitable breeding stock. It seems that this is a good time for farmers to replace their old stock with young mares at prevailing prices, especially if they intend to continue their operations with horse power. This would put them in a position to undertake colt raising for their own replacements and for the market as well when horse and mule prices reach levels that would make this profitable. There is now a good market demand for farm chunks, good mares, and saddle horses of merit at good prices. Inferior horses of all types are a drug on the market and undoubtedly will continue so. The market is discriminating, and the breeder who uses good breeding stock with a view of producing horses of a definite type and good quality will no doubt be amply repaid for his foresight. When the advantages of animal power are realized it is economically sound to presume that horses and mules will continue to be the principal sources of power on farms.

Some of the distinct advantages of animal power are:

(1) Lower initial cost.
(2) Cheaper power for tractive operation.
(3) No cost outlay for feeds necessary.
(4) Replacements (colts) can be raised.
(5) More flexibility of power—units can be added to suit the job.
(6) Reserve power for emergencies.
(7) More dependable.
(8) Can be used in various types of soil and work where tractors cannot be used.

To those who face the problem of replenishing their work stock in view of the present situation, it seems that the paramount things to be considered are (a) the desirability of getting good young mares at present prices, and (b) making provision for stallion service. In order to assist in the proper selection of breeding stock I am presenting a series of photographs depicting the desirable and undesirable qualities to look for in draft horses.

(Here the speaker discussed a large number of highly interesting and instructive views that were projected on the screen. These views illustrated different breeds and types and important details of desirable and undesirable conformation.)

THIRD SESSION

Lord Baltimore Hotel

Vice-President Jones presided at the third session of the Association's meeting in the absence of President Wolfe.

Mr. J. W. Jones discussed in an interesting and instructive address the campaign for selling stock in the Eastern Live Stock Co-operative Marketing Association, Inc., the beginning of the work of that organization at the Baltimore market, and plans for establishing an agency at Jersey City. Reference was made to the active interest

and assistance on the part of the Farm Bureau and the Federal Farm Board. He warned against expecting too much from the co-operative selling agency, stated that it cannot secure miraculous prices, and said that it should not be expected that they could get more than the livestock is worth at time of marketing. He expressed confidence in the usefulness of the co-operative selling organization and urged stockmen to support it through the purchase of stock in the organization and through the consignment of livestock shipments to the most accessible of its agencies.

CHAIRMAN JONES: Mr. W. R. Harvey, manager of the Baltimore Livestock Show, will now present a report of the 1932 show and of livestock sales held in connection with that event.

1932 BALTIMORE LIVE STOCK SHOW

By W. R. HARVEY, Manager.

Mr. Chairman and Gentlemen:

Baltimore's fourth annual Live Stock Show was held at the Union Stock Yards, October 18, 19, 20 and 21, 1932, under the management of the speaker, who had also managed the three former shows.

Stock began to arrive early in large numbers. Monday was taken up altogether in placing the cattle and making them presentable and comfortable for the week's show.

Tuesday visitors began to arrive and the day was devoted to inspection of the exhibits of different stock on display, as well as watching the judging of the stock, which began promptly at 9 o'clock. Prizes were awarded in the different classes as follows:

Department A, Class 1, carload of 15 head of steers or heifers weighing over 1,100 pounds.

1. Clinton County, Ohio, Steer Club, Wilmington, Ohio.
2. John K. Martin and Sons, Troy, Ohio.

In Class 2, carload of 15 head of steers or heifers weighing under 1,100 pounds.

1. Briarcliff Farms, Pine Plains, New York.
2. Hayner Farms, Troy, Ohio.
3. Clinton County, Ohio, Steer Club, Wilmington, Ohio.
4. John K. Martin & Sons, Troy, Ohio.

Department B, Fat Cattle Southeastern District, Class 1, carload of 15 head of steers or heifers weighing over 1,100 pounds.

1. D. E. East, Brownsburg, Virginia.
2. G. W. Miley, Moorefield, West Virginia.
3. Thomson Sowers, White Post, Virginia.
4. George T. Williams, Moorefield, West Virginia.

Class 2, carload of 15 head of steers or heifers weighing under 1,100 pounds.

1. F. H. T. Walton, Forest, Virginia.
2. U. S. Morrow & Sons, Flemington, West Virginia.
3. Lauxmont Farms, Wrightsville, Pa.
4. Arthur B. Shipley, Woodbine, Md.

Champion carload of fat cattle, open classes, Briarcliff Farms, Pine Plains, New York.

Grand champion carload of fat cattle, Briarcliff Farms, Pine Plains, New York.

Grand champion of fat cattle, Briarcliff Farms, Pine Plains, New York.

Reserve champion carload of fat cattle, F. H. T. Walton, Forest, Virginia.

Department C, three steers or heifers open to all, Class 1. Three steers or heifers fed and owned by exhibitor.

1. Fox Hill Farms, Fallston, Maryland.
2. Briarcliff Farms, Pine Plains, N. Y.
3. F. H. T. Walton, Forest, Virginia.

Grand champion trio of steers or heifers, Fox Hill Farms, Fallston, Maryland.

Department D, individual steers and heifers, open to all, Class 1. Individual steer or heifer, fed and owned by exhibitor, exhibited at halter, club steers not eligible.

1. Fox Hill Farms, Fallston, Maryland.
2. Briarcliff Farms, Pine Plains, New York.
3. Briarcliff Farms, Pine Plains, New York.

Grand champion individual steer or heifer, competed for by winners in Departments D and E, Fox Hill Farms, Fallston, Maryland.

Reserve champion individual steer or heifer, Thomas Anderson, Marion, Virginia.

Department E, 4-H Club steers or heifers, Class 1.
Herefords

1. Thomas Anderson, Marion, Virginia.
2. Ellis Inlow, Wilmington, Ohio.
3. Billy King, Wilmington, Ohio.
4. James Harman, Petersburg, Vest Virginia.
5. Rucker Bros., Deloplane, Virginia.
6. Jack Johnston, Sugar Grove, Virginia.
7. Hegueland Taylor, Petersburg, West Virginia.
8. Ellis Inlow, Wilmington, Ohio.
9. Willard Harrick, Wilmington, Ohio.
10. Harold Gregory, Wilmington, Ohio.

Class 2, Shorthorns.

1. Grove Bros., Staunton, Virginia.
2. Dudley & Moore, Staunton, Virginia.
3. Frank McClung, Ronceverte, West Virginia.
4. Dudley & Moore, Staunton, Virginia.
5. Charles Meek, Marion, Virginia.
6. Fred Harman, Petersburg, West Virginia.
7. Dwight Skaggs, Lewisburg, West Virginia.
8. Jack Eller, Marion, Virginia.
9. Jack Eller, Marion, Virginia.
10. Chester Ballenger, Clayton, West Virginia.

Class 3, Angus.

1. Tom Anderson, Marion, Virginia.
2. Green Bros., Markham, Virginia.
3. Hugh E. Rehmert, Troy, Ohio.
4. Rucker Bros., Deloplane, Virginia.
5. Green Bros., Markham, Virginia.
6. Tom Goodman, Marion, Virginia.
7. Rucker Bros., Deloplane, Virginia.
8. James Wall, Crawley, West Virginia.
9. A. A. Sites, Petersburg, W. Virginia.
10. Robert Nixon, Bridgeport, West Virginia.

Grand champion Boys' 4-H Club steer or heifer, Thomas Anderson, Marion, Virginia.

Department F, feeder cattle, Class 1, carload of 20 head of Hereford, Shorthorn, or Angus steers or heifers, weighing under 550 pounds.

1. Lett & Kelly, Union Stock Yards, Chicago.
2. D. I. Painter, County Agent, Independence, Virginia.
3. Wertheimer Cattle Co., St. Paul, Minnesota.
4. D. I. Painter, County Agent, Independence, Virginia..

Class 2.

Carload of 20 head of Hereford, Shorthorn or Angus steers or heifers weighing 550 pounds and not over 850 pounds.

1. Lett & Kelly, Union Stock Yards, Chicago.
2. William F. Gore, Charleston, West Virginia.
3. Wertheimer Cattle Co., St. Paul, Minnesota.
4. Wertheimer Cattle Co., St. Paul, Minnesota.

Grand champion carload of feeders, Lett & Kelly, Union Stock Yards, Chicago.

Department G, fat hogs, Class 1. Carload of not less than 50 head of fat hogs weighing 150 to 225 pounds.

1. Susquehanna Farms, Pearson, Maryland.

Class 2, pen of five fat hogs weighing 150 to 225 pounds.

1. University of Maryland, College Park, Maryland.
2. Susquehanna Farms, Pearson, Maryland.
3. H. G. Nelson & H. G. Nelson, Jr., Monkton, Maryland.

Class 3, individual barrow weighing 150 to 225 pounds.

1. University of Maryland, College Park, Maryland.
2. University of Maryland, College Park, Maryland.
3. Susquehanna Farms, Pearson, Maryland.

Grand champion carload of fat hogs, Susquehanna Farms, Pearson, Md.

Grand champion pen of five fat hogs, University of Maryland, College Park, Md.

Grand champion barrow, University of Maryland, College Park, Maryland.

Department H, fat lambs, Class 1. Carload of not less than 50 fat lambs.

1. Richie County Livestock Shipping Association, Harrisville, West Virginia.
2. W. M. Shaver, Forestville, Virginia.
3. G. C. Dixon, Bayard, West Virginia.

Class 2, pen of three fat lambs.

1. Buck & Doe Run Valley Farm, Coatesville, Pennsylvania.
2. G. C. Dixon, Bayard, West Virginia.
3. W. L. Spencer, Sykesville, Maryland.

Class 3, individual fat lamb.

1. Richie County Livestock Shipping Association., Harrisville, West Virginia.
2. Buck & Doe Run Valley Farm, Coatesville, Pennsylvania.
3. Betty Wunder, Baltimore, Maryland.

Grand champion pen of three fat lambs, Buck & Doe Run Valley Farm, Coatesville, Pennsylvania.

Grand champion individual fat lamb, Richie County Livestock Shipping Association, Harrisville, West Virginia.

THE BANQUET

The annual banquet is the outstanding social feature of the Live Stock Shows. The 1932 banquet was given as a testimonial dinner to the president of the show, Mr. J. H. Baugher, by his friends, and was probably the most im-

pressive function of its kind ever attended by men who are actively engaged in the various branches of the livestock industry.

The large ballroom at the Southern Hotel, where the banquet was held, was taxed to its utmost to accommodate the 530 guests who were in attendance.

Mr. Joseph P. Healy presided and was toastmaster. Other speakers of the evening were: Hon. Howard W. Jackson, Mayor of Baltimore; Dr. R. A. Pearson, president of the University of Maryland; Dr. T. B. Symons, director of the Extension Service of the University of Maryland, who represented Governor Albert C. Ritchie; Ex-Governor Howard Gore of West Virginia; Mr. William H. Pew, manager of the Briarcliff Farms, Pine Plains, N. Y., who were awarded the grand championship on their load of Angus steers; and Dean Bedford of Fox Hill Farm, Fallston, Maryland, who won the grand champion steer prize on his Angus steer, Paymaster, also grand champion on trio of steers, the first time those prizes had ever been awarded to Maryland steers.

An exhibit worthy of special mention was made by the Clinton County (Ohio) Steer Club of Wilmington, Ohio. Credit for this splendid exhibit is due very largely to Mr. O. K. Quivey, agricultural agent for the Baltimore & Ohio Railroad, and Mr. Walter H. Bluck, county agent of Clinton County, Ohio. They had on display 103 head of yearling Hereford steers, every one of them a good one, fed and handled entirely by 4-H Club boys. The shipment of these cattle was accompanied by more than 150 people who came by special train over the Baltimore & Ohio to attend the show and later take in the sights at Washington, Mount Vernon, and Alexandria, Virginia.

THE SALE

The entries in all classes were so much larger than they had been in former years that it took two full days to sell the stock. The carloads of fat cattle were sold on Thursday;

individual steers, feeders, hogs, and lambs were sold on Friday.

The grand champion carload of fat cattle sold for $19 per cwt., which was $3.50 per cwt. higher than the grand champion load sold for at the 1932 International Live Stock Show at Chicago, and $7.75 per cwt. more than the grand champion load at Omaha sold for in 1932. The reserve champion load sold for $12.

The 3,232 head of cattle on exhibition that passed through the sale ring brought a total of $235,855.91. The 93 hogs sold for $975, while the 675 lambs brought $2,654.47.

Following is an analysis of the fat cattle sale:

The highest selling five carloads averaged	$12.71
The highest selling ten carloads averaged	10.38
The highest selling twenty carloads averaged	8.92
The highest selling forty carloads averaged	8.05
The highest selling eighty carloads averaged	7.41
The highest selling hundred carloads averaged	7.12

There were 132 steers that were sold as individuals, bringing a total of $10,138.69. The grand champion individual steer sold for $76 per cwt., with the reserve champion bringing $26.

The highest selling five individuals averaged	$28.25
The highest selling ten individuals averaged	20.02
The highest selling thirty individuals averaged	13.37
The highest selling forty individuals averaged	12.40
The highest selling sixty-five individuals averaged	11.10
The highest selling hundred individuals averaged	10.13

FEEDER CATTLE

There were 482 feeders that sold for a total of $16,435.96, about half calves and half yearlings. The grand champion load sold for $7.50 per hundred, with the reserve champions bringing $7.35.

The 13 loads of calves averaged $6 with a $7.50 top.

The 15 loads of yearlings averaged $5.47 with a $6.75 top.

HOGS

There were 93 hogs that sold for a total of $975. The grand champion carload sold for $5.25; the grand champion pen of five, $4.85, and the grand champion barrow for $11 per cwt.

LAMBS

There were 675 lambs that sold for a total of $2,654.47. The grand champion carload brought $6.75. The grand champion pen of three, $9.50, and the grand champion individual, $21, with one other selling for $27 per cwt.

A total of 4,002 head of cattle, hogs and lambs sold for a grand total of $237,485.38.

One of the outstanding features of the Baltimore Livestock Show was the consignment sale of purebred Aberdeen-Angus breeding cattle. It resulted in an average of $95.50 per head on 20 head of calves and yearlings. Mr. Dean Bedford, owner of Fox Hill Farms, Fallston, Maryland, was the strongest contender for the better heifers and succeeded in getting three head of them. Among the buyers to lay foundations for new breeding herds were Mr. B. V. Flannery, Darlington, Maryland; Mr. J. H. F. Mayo, West River, Maryland; Mr. H. G. Nelson, Monkton, Maryland; Dr. William H. Trail, Rockville, Maryland; and Mr. W. D. Blick, Clarksville, Maryland. Many bidders went away without cattle, indicating an unusually thrifty demand for real good purebred Angus cattle in this section.

20 head	$1,910.00	average	$ 95.50
5 bulls	535.00	average	107.00
15 females	1,375.00	average	91.66

CHAIRMAN JONES: In the absence, due to his illness, of Mr. L. E. Bopst, who presented a valuable paper at our meeting of last year, Dr. L. B. Broughton, State chemist and head of the Department of Chemistry at the University of Maryland, College Park, will now present Mr. Bopst's paper.

READ THE FEED TAG

By L. E. BOPST,

Associate State Chemist.

Last year I discussed before your Association the general subject of Feed Control Activities in Maryland without emphasizing any particular phase of this work. This year I have been requested to deal more specifically with our problems, and I trust I will be able to entertain you with a short talk which we shall call "Read the Feed Tag."

The Maryland feed law operates in your interest to protect your feed supply and to prevent the sale to you of misbranded and adulterated products. In the great movement to insure purity and to bring to you honestly labeled feed and feed products, the Feed Inspection Service of Maryland has always had the closest co-operation of the Federal Government. It has had the whole-hearted and effective co-operation of the reputable manufacturers of the feed trade, but it has not had complete co-operation of those who are most interested, and that is your good selves, the consuming public. You may well ask, "How may we co-operate in insuring honesty in labeling of feed and feed products?" The answer is, "Read the tags or labels." Read them intelligently and insist upon being supplied with the exact commodity you desire to purchase. The Maryland feed law requires every package except those marked, "Mixed-to-Order," to carry a plain and conspicuous statement of the net weight; the name, brand, or trade-mark of the product; the name and address of the manufacturer; guarantees for protein, fat and fiber; and the name of each product used in its manufacture. The first injunction to you, therefore, is to read the quantity of content statement on the label, that is the net weight. Make sure you are getting the number of pounds of feed for which you are paying your money. Next, in order of their appearance on the tag, is the name of the product. Do not be misled by

fancy-sounding names such as "Wonderful New Discovery Dairy Feed," "Extra Fancy Pure Wheat Bran," or such questionable designations as "Vita-Life Feed" and "Nature's Perfect Health Feed." These products are usually accompanied by false and extravagant claims. Much time has been spent by your Feed Inspection Service in keeping the names and claims for these products in line with their actual virtues. Give consideration to the guarantees which are shown upon the feed sack. It is true that guarantees for protein, fat, and fiber do not always accurately indicate the feeding value of a particular product. On the other hand, they are an index of its value, and when used in conjunction with the statement of ingredients, which appears on the sack, will give the average feeder a close index of the value of the product.

Look for the label declaration of artificial color. We have found materials such as molasses alfalfa horse feeds colored green with a coal tar dye. When artificial coloring is used in feeds a statement to this effect must be carried on the label. Very often such colored material conceals inferiority; that is, it makes the resultant product appear decidedly more attractive than it actually is. The use of coloring in feeds, however, is not practiced to any great extent.

The Maryland feed law has no jurisdiction whatever over advertisements in newspapers, magazines, on billboards, by radio or by other means. It applies only to the label which accompanies the package. Therefore, the label should be your guide, and if you find statements and advertisements exceeding in their meaning and in their claims the statement on the labels, it will be fair to look with suspicion at least upon the advertisement.

There is an organization known as the Association of American Feed Control Officials which studies feeds; determines what the normal and proper compositions are; ascertains what constitutes the best trade manufacturing process;

intelligently determines what is the public understanding of the composition of feeds; holds hearings; and finally adopts standards for various feed commodities on this basis. From this you will at once see that standards and definitions are not made to represent the opinion of any one individual, but, rather, these definitions and standards represent the best trade practice and the preponderance of enlightened thought. All facts are determined, and this is an arduous process. Definitions and standards for 143 feed products have been formulated by this Association. I have approximately 100 copies of these definitions, which normally sell for 20 cents. I take pleasure in presenting to you gentlemen present a complimentary copy of these definitions, which I am sure you will find very interesting and instructive.

In recent years we find a development in the marking of feeds which is of very great importance. Some feeds are being advertised and sold on the basis of their vitamin content. Statements such as "Rich in Vitamin," used with many variations and amplifications of larger dimensions, are frequently appearing on present-day labels and in current advertisements. Many such statements are false and even more of them are misleading. The testing for vitamin content of feed materials is a very slow and expensive process. The process of legally enforcing vitamin label statements to limitations of strict truth has not yet been accomplished, nor will it be possible to do so for some little time to come. Our work of this nature thus far has been confined strictly to the biological assay of cod liver oil and other materials sold for their vitamin D properties. I realize that dairymen are not particularly interested in cod liver oils, yet at the same time practically all of you feed poultry and, as you know, cod liver oils and allied products enter into the composition of most all mashes. The testing of such material consists in feeding baby chicks with a ration which will produce rickets within five weeks. This basal ration is supplemented with small amounts of

vitamin D carriers. After five weeks the chickens are killed and the ash content of the chicks receiving cod liver oil is compared with that of those not receiving such material. Chicks that receive adequate amounts of vitamin D material show an average ash content from 10 to 14 per cent higher than those receiving the basal ration. Maryland is the only State on the Atlantic Seaboard rendering such service to poultry raisers.

An examination of our records shows that we have had thirty-two major violations of the Maryland feed law this year. By major violations, I mean those of sufficient importance to warrant prosecution. In the belief that you will be interested in the specific relation of these violations and an examination of the products involved, I will discuss them in detail.

The first found was a shipment of two cars of alleged dried buttermilk feed from Milwaukee, Wisconsin, to Maryland. From the feed rules and definitions which you have, you will note that there is a 5 per cent fat standard for dried buttermilk. These products, instead of containing 5 per cent fat, actually contained less than 1 per cent. Obviously, we immediately looked upon this material with suspicion and later it was found that the material was actually dried skimmilk instead of dried buttermilk.

The next violation represented a shipment of wheat middlings from Ohio to Hagerstown. This product was labeled "Pure," but upon examination under the microscope was found to contain an appreciable amount of screenings.

The next case was a shipment of the same material to Hagerstown by the same company. This material also contained added screenings, although it was labeled "Pure."

The next consisted of a shipment of meat scrap from Pennsylvania to Maryland. This shipment was 7 per cent deficient in protein.

The next was a shipment of fish meal from Philadelphia

to Maryland. This material contained 6 per cent salt, the presence of which was not declared upon the label. Obviously the purchaser of this material was paying a feed price for salt.

A shipment of dairy feed from Akron, Ohio, to Maryland, labeled 24 per cent protein, actually contained a little more than 21 per cent. The manufacturer stated on the label that linseed meal was one of the ingredients used in its manufacture, when actually no linseed meal was present.

The next was a shipment of 16 per cent dairy feed from Urbana, Ohio, which was low in protein and contained ground oat hulls in place of linseed meal, which was declared to be present.

Two more shipments of alleged dried buttermilk, which were actually dried skimmilk, were found.

The next was a shipment of pure wheat bran from Michigan to Maryland, labeled "Pure," and which contained 5 per cent screenings.

A very interesting case covering a shipment of alleged alfalfa leaf meal from California to Baltimore showed the product to be 4 per cent deficient in protein and to contain approximately 20 per cent ground alfalfa stems instead of alfalfa leaves. As you know, the stems are decidedly inferior in quality when compared to leaves.

Three more shipments of wheat by-product feeds, labeled "Pure," were found to contain appreciable amounts of screenings; a shipment of meat scrap, 6 per cent low in protein; a shipment of peanut meal to Belair, Maryland, guaranteed 45 per cent protein, actually containing 38 per cent; another shipment of peanut meal to Montgomery County, 4 per cent low in protein.

I would not have this audience believe that this specific relation of violation would indicate that the majority of feeds sold in Maryland are either misbranded or adulterated. This is most assuredly not the case. Most manufacturers

and dealers earnestly desire to comply with all reasonable regulations, not only on ethical grounds, but also because it is a part of good business. Considering the volume of manufactured products coming within the jurisdiction of this law, the proportion found adulterated is very small. It is necessary, however, for law enforcement officials to be constantly on the alert to restrain that small portion of the industry who will still take the chance of producing a dishonest product.

CHAIRMAN JONES: Dr. Hugh C. McPhee of the United States Department of Agriculture will now talk to us on an important subject, *Research in Practical Animal Breeding Problems.* I am sure that we shall be interested in this discussion.

RESEARCH IN PRACTICAL ANIMAL BREEDING PROBLEMS

By DR. HUGH C. MCPHEE,

United States Department of Agriculture.

The breeding problems which are of the greatest importance to the livestock producer are those which are concerned with the inheritance of characteristics having some economic value. Leaving out of consideration the things which have their chief value in an esthetic way, we find that the real problem is one of uniform and economical production of superior quality products. This is really not a single problem, but a whole group of problems concerning the heredity of such characteristics as fertility, rate and economy of gain, rate of maturity, type and quality of carcass. Of course the problems are not exactly new ones, but have existed ever since animals were first domesticated for the use of man. Neither are the problems peculiar to any one class of stock, but are pretty much the same whether one is dealing with beef cattle, sheep, or swine. It is prob-

ably true, however, that the ease with which improvement in a breed could be achieved has changed as the breeds became more highly specialized for certain functions. So perhaps in this present era of specialization the livestock man meets with breeding problems of a more difficult nature from the standpoint of the breeds as a whole that did the animal husbandman of half a century ago.

For the purpose of this discussion I have divided the subject-matter into three parts: First, a very brief summary of knowledge on the role of heredity in the expressions of such characteristics as fertility, rate of gain, mature weight and type; second, a discussion of attempts which have been made to apply such information; and third, a discussion of probable trends of breeding research having to do with these economic characteristics.

Most of the research results in animal genetics have been obtained from laboratory animals because of the economy with which they may be raised and their rapid multiplication. Although it may be a long step from the guinea pig and rat to a beef animal, yet the results obtained by using these little animals do have an important bearing upon the probable methods which will have to be used if hereditary control over certain characteristics in livestock is to be realized. It has been shown, for instance, that heredity does affect the expression of such characteristics as size and frequency of litter, birth-weight, rate of gain, mature weight and resistance to tuberculosis. An important fact, however, is the finding that the relative influence of heredity in any individual case is so small that only by a system of continued close breeding can strains be developed which differ significantly. Thus it was found that less than 10 per cent of the variation in rate of gain and size of litter was due to heredity in the individual. By this we mean that if heredity for size of litter could be made identical in each individual, variation with respect to size of litter would be reduced somewhat less than 10 per cent. Furthermore, it was found that such characteristics were largely inde-

pendent of one another in their inheritance. Thus a strain of breeding might become very superior in size of litter, but inferior in rate of gain and resistance to disease. The conclusion reached was that there is not an inheritance of general vigor as such, but rather of the several independent characteristics which go to make up the general vigor of a stock. Inbreeding brings about an automatic fixation for the heredity of such characteristics, although in the guinea-pig experiment there was a distinct decline in all the elements of vigor in comparison with the non-inbred control stock. This decline was immediately restored, however, when inbred strains were crossed and in some cases an increase over the control stock was shown. The important conclusion reached so far as animal breeding is concerned was that by a system of close breeding the heredity for certain complex characteristics can be fixed in true breeding strains and by crossing these strains the lost vigor is recovered. By further inbreeding of such crossed lines new combinations can be obtained which may be superior to the foundation lines of breeding.

Now what do such experiments with small animals show us concerning the economic characteristics of livestock which we are interested in improving? First, they show us that inheritance plays a major role; second, they show us that inheritance of such things as rate of gain, size, fertility, etc., has what we call a multiple factor basis. That is, the heredity for any one character is made up of a large number of units of heredity whose presence cannot be detected by examination of an individual animal. In inheritance of this type there is a distinct tendency for blends to occur when extreme manifestations of the characters are crossed. Progress in selection is thus made very difficult. By close breeding this difficulty is, in some measure, overcome, but as a general method for breeders to use it has some very serious drawbacks which I shall mention later.

The application of the method of improvement indicated by the small-animal invesigations to domestic livestock has

not progressed very far. Yet it is a well-known fact among animal breeders that in the past many of the outstanding instances of notable improvement have been the direct result of the use of just such close breeding, accompanied by stringent selection. There is one investigation going on at the present time which has furnished information upon the point, and I want to take a few minutes to discuss it briefly.

In 1924 an investigation with swine was started by the Animal Husbandry Division of the United States Department of Agriculture to test the feasibility of using the breeding recommendations obtained from the inbreeding studies with small laboratory animals. Several lines were started by mating litter mates and continuing as long as possible. I have not time to go into detail concerning all the things we have found, but briefly much similarity has been observed between the results of the swine inbreeding and the small-animal studies. Many lines soon ran out and those which persisted were distinctly inferior in most respects to the non-inbred control stock. On the average, litter size was lower, more services were required to settle the sows, mortality was higher among the pigs at all ages, and sexual maturity was considerably delayed. But, as was found with the laboratory animals, a few lines were found which persisted under the system of continued brother-sister mating. Out of ten lines started in three breeds, only one line of Tamworths and one of Chester Whites remain, both of which have been through five generations of successive brother-sister mating. While these lines were being developed hidden characters made their appearance and became fixed because of the automatic effect of inbreeding. In many cases the numbers were so small that selection could not be practiced to the extent desired and thus not all of the undesired characteristics could be avoided. Among the characteristics for which the results indicate an hereditary basis I might mention the following: Cleft palate, the failure of the bones to develop in the roof of the mouth, which results in the death of the young soon after birth; whorls or swirls in the bristles of

the back and sides, which was characteristic of the Tamworth line; the ridgeling character, which was characteristic of the Chester White line; changes in type resulting in a shortening of body in Tamworths and changes in type among the Chester Whites first from medium to large and then back to medium with a tendency to go to the small type; a tendency on the part of the later generation inbred Chester Whites toward a distinctly plumper ham and an evenness of finish.

Before discussing further this line of Chester Whites I want to say a word about the method of feeding and determining the quality of the carcasses. We are using the Record of Performance procedure, which is sponsored by the National Swine Growers' Association. The plan is one in which individual matings are tested for prolificacy, breeding qualities and carcass quality. In order to be eligible for the test a gilt must raise seven and a sow eight pigs to 56 days of age. Four pigs, two females and two barrows, from the litter are placed in a concrete-floored pen and fed on a mixed feed of known composition until they reach a live weight of 225 pounds. When this weight is reached the hogs are slaughtered, and data on the dressing percentages, carcass measurements, and quality of carcass are obtained. From these data and the feed record it is possible to compute the economy of gain and the quality of the product. Thus the breeder is able to determine the performance of the breeding animals in his herd.

Now to return to the inbred strain of Chester White hogs, I want to give you a few figures on crossbred and inbred pigs from the same sow. A third-generation inbred sow was bred to her litter mate and produced a first litter of nine pigs and raised seven of them to 70 days of age. This performance made her eligible for the record-of-performance test, but we saved all of her young to perpetuate the line. The next season she was bred to in inbred Tamworth boar and raised 10 pigs. All of these were placed on the record-of-performance test, four in one pen and six in the other.

The lot of four reached the 225-pound weight in 191 days from birth, made an average daily gain of 1.52 pounds and consumed 363.6 pounds of feed per 100 pounds gain. The lot of six reached the slaughter weight in 195.3 days from birth, made an average gain of 1.42 pounds and consumed 361.8 pounds of feed per 100 pounds gain. The carcasses all graded choice and were very uniform in all respects.

The following season this sow was bred to an inbred Chester White boar and raised 11 pigs. Four of these were placed on the record-of-performance test and have just been slaughtered. The average daily gain was 1.04 pounds, the average age at slaughter was 251 days, and the amount of feed consumed per 100 pounds gain was 395.3 pounds. Two of the carcasses graded low prime and the other two the top of choice. The hams were very plump and the finish was even, but inclined to be slightly too much.

This is an interesting comparison of the performance of an inbred and a crossbred litter of the same size from the same sow and with feeding controlled as much as possible. It was found that the greatest difference was in rate and economy of gain and the uniformity of the litters in these respects. There was little difference in quality of carcass, although the inbreds were slightly smaller in type and plumper in hams than the crossbreds. But it took 31.7 more pounds of feed per 100 pounds gain and about 56 days more time to grow the inbreds than it did the crossbreds. There appears to be a slight advantage in favor of the crossbred pigs in rate and economy of gain, but, of course, they are at a great disadvantage from the breeding standpoint. The breeder can go on with purebred hogs, but cannot safely do so with crossbreds. If, however, we had been able tc cross two unrelated inbred strains in the same breed, it is probable that results similar to those obtained in the Tamworth-Chester White cross would have been obtained, and such crossed pigs could have been used for breeding.

The same sow was again bred to an inbred Chester White

boar and produced 11 pigs for her fourth litter. This litter is now on record-of-performance test. Thus we see that this sow has met the requirements for the record-of-performance test in all the litters farrowed. Although she did not wean her first litter until she was 21 months old, during the next 18 months she weaned over 1,500 pounds of young. Furthermore her offspring are proving to be good breeders and earlier in sexual maturity than she was.

Now, of course, what I have been discussing is research and not necessarily practical animal breeding, although the hope is that many things of practical value will come from it. The breeder is more interested in getting his herd up to an approximation of the best in the breed rather than in further improving the best that already exist. First of all he needs some measure by use of which he can identify the superior breeding animals. This is a thing which record of performance for cattle, sheep and swine is intended to do. Of course the immediate problem is one of developing accurate measures which can be used to identify the genotype and not one of animal breeding. When these measures have been developed a simple program of selection and line breeding should bring about marked improvement.

The organization of the record-of-performance work for swine has made considerable progress in this country during the last three years. In 1931 the Iowa Agricultural Experiment Station tested 20 litters, and since 1929 we have tested 22 litters at Beltsville. Other States are also testing pigs by the same method. In Iowa I believe that a modified record of performance is being used in the Extension Service. In Canada there is a national movement for swine improvement by means of record-of-performance test and they have progressed to the point where certain superior animals have been listed in a register of merit.

There has been less done with the organization of breeding improvement in the economic characters of cattle and

sheep than of swine. We have been feeling our way with beef and dual-purpose cattle at Beltsville, Md., and with sheep at the Federal Sheep Station, Dubois, Idaho. At Beltsville we are measuring the amount of feed consumed by the calves from birth until a 900-pound weight is reached. Body measurements are taken at regular intervals and extensive carcass data are obtained when the animal is slaughtered. A cooking test of the meat is also made. From these data we hope to arrive at an index which can be used to express the breeding worth of a mating. Here again the major problem at present is one of accurately measuring variations and maintaining conditions of feeding and management which will allow breeding variations to be recognized.

With sheep we have to consider both meat and wool and, of course, the problem is not made any easier by this fact. Wool can be easily weighed, however, and there are well-established measures of quality. The problem is then largely one of recording data obtained under comparable conditions. With lamb production the problem is not quite so easy because we are faced with the same sort of a thing that is met with in the evaluation of the meat in cattle and swine. We are using the Rambouillet breed at present and are developing within this breed two contrasting lines. One is being bred for excellent fleece characteristics and the other line for superior mutton conformation. By breeding on the basis of records made by the offspring and using a system of close breeding we have already intensified the respective characters in the two lines of breeding. It is too early to attempt to generalize from what we have observed but this much is certain; there is a big field for improvement if a breeding system based on performance rather than appearances is put into wide use.

In conclusion I want to point out that there is every indication of increased interest in the proving of breeding stock in this country. The movement is not confined to dairy cattle and poultry but includes cattle raised for beef

as well as milk, swine, sheep, and horses. The eugenecists are even clamoring for more selective breeding practices in human stock. So as time goes on we may expect to see stock which is much more efficient and more uniform in quality due in part to the use of improved breeding as well as to improved feeding. The mode of inheritance of the characters will not change, but the matter of locating the desired combinations of hereditary material probably will be much easier than it is at the present time. In fact we haven't any method of locating the sheep, the beef cattle, and swine which are the best breeders except by a knowledge of the breeds as a whole at the present time. And the sad part of it is that much of the information is merely guess work and hearsay. I predict that research will play a major part during the next few years in overcoming this deficiency, but I doubt whether our knowledge of genetic details will be very much greater than it is today.

MR. JONES: The next thing on our program is a round table discussion of the general topic, "How May We More Effectively Improve the Product and Income From Maryland's Herds and Flocks." We shall first hear from Mr. J. Herbert Snyder of Carroll County.

MR. J. HERBERT SNYDER, Carroll County: Life has always existed under the natural law of the survival of the fittest. That is nearly as true today as in the early days when each plant and animal had to fight for its very existence; when only the strong survived and the weak perished. In this day of efficient production, when over-production has become the rule instead of the exception, the livestock producers themselves are falling before that natural law, the survival of the fittest.

The breeder and feeder who produces high-class products economically will be the one to survive, farm relief measures notwithstanding. Today it is hard to sell any product regardless of quality, while the inferior finds no buyer regardless of price. It is, therefore, necessary to put on the

market a superior product at a cost of which we can compete with our fellow producers.

All livestock breeding is based on three fundamentals: heredity, environment and training. Training applies to horses and dairy cattle but has little effect on meat animals. Environment takes in feeding and care and is of utmost importance, but heredity or breeding is the foundation upon which all other principles are based. It therefore behooves us to breed a superior animal before applying the proper principles of feeding and management.

Bankers will tell you that the farmer who owns a purebred sire is a better risk than the one with only scrubs. A survey of 500 farms in the Central West showed the farmers keeping purebred livestock produced 50 per cent more income than those keeping only scrubs.

The first step in improving our livestock is to use a purebred sire of proper inherited ability. Not every sire will do. He must be a good purebred and not a scrub purebred. The better the herd he is used in, the higher quality he must be. The second step is the establishment of an all purebred herd. The same principles that apply to the selection of the sire should be applied to the selection of the females. In all contests in the production of meat, as an individual, pen, litter, or carload either the high grade or purebred has won, with the purebred in the majority. A carload of stock of good conformation and rich in blood has always commanded a premium. The third step is to produce a superior purebred.

Up to the present time practically all of our standards for meat-producing animals have been based on show-ring standards—what we can see with the naked eye. The dairy cow has the milk scale and the Babcock test, the hen the egg-laying contest, but the steer, barrow and wether still depend on the gross weight and the eye of the buyer. Killing contests have helped somewhat but not enough. The plant breeder has found that there is no correlation between

the type of an ear of corn and the yield. The dairy cattle breeder has found that many of the characteristics given stress in the show ring have no correlation with milk production. It would then seem necessary to devise a test for meat animals that would establish the important characteristics. With the results of these tests it would be possible for the breeder to breed a superior animal that would have a high killing percentage, produce a high grade product and at a cost which would enable the breeder to compete with low prices.

A number of experiment stations both in this country and abroad have been working with such a test on hogs. It would be well if our own experiment station would give this matter some study with an idea of establishing the test when practical, and that the breeder would give this test a thorough trial with the idea of improving Maryland livestock.

MR. S. O. JONES, Howard County: My qualifications to join in the discussion of this subject are based, I presume, on the progress of my flock of registered Hampshire sheep, which I started several years ago. I, since a boy, have always been, and still am, keenly interested in sheep. I bought my ewes in the early summer, and that fall I selected what I considered the best of the lot and took them to the Timonium Fair. The results I obtained there in competition with other flocks, were such that I immediately realized I had to make some big improvements in my flock if I wanted to do anything with them.

I had already bought a very well-bred ram, which stood second in his class there as a yearling. I then bought an outstanding ewe and two ewe lambs from a prominent Western breeder. I then felt I needed some very practical information, so I started visiting breeders whose flocks I knew were the leading ones in my section. I talked with these men, and they were all most friendly. I gained some really valuable information. In the meantime I was also studying some authorities who had written books on the subject.

My lambs came, and I grew them out the best I could. The next year I exhibited at Timonium, and just about doubled my previous winnings—including the cup for the best pen of four lambs, either sex, breed and exhibited by a Maryland breeder.

After getting two crops of lambs from my original ram, he died. My ewe flock had increased to 50 head. By this time I had become able to recognize type, and other points necessary to make up a good sheep, whereupon I bought, from an Eastern breeder, two rams whose ancestry had produced good sheep, and from my 50 ewes I selected 25 for each ram, trying to mate each ewe to advantage with the ram. I had also added to my flock three ewes, which had won in their classes whenever shown.

Lambs from this combination were exhibited at two fairs, Cumberland and Timonium, last year, along with older sheep to fill the aged classes. At Cumberland I was not defeated, at Timonium I did better than I had ever done before. This personal account has, perhaps, appeared egotistical. However, I knew of no better way to approach the improvement of the product side of the subject then to enumerate the steps which I took.

Now, as to the last part of the subject, improving the income, this has been and always will be governed by supply and demand. However, I have been castrating and culling my sheep very closely, selling for breeding purposes only such animals as I would want to buy myself. I have always thought that in order to get the most from an individual, he must be developed as well as possible. To command interest from a prospective buyer he must be presented in a pleasing manner. I guarantee each animal to be a breeder. I also advertise in a moderate way in one of the leading journals. But I consider that the most important of all these is development. If an animal is not well developed, regardless of what his breeding might be, he will not bring the top price.

MR. W. ALAN MCGREGOR, Kent County: As a new producer

in Maryland, I was hoping that I could sit and listen and learn rather than say anything myself. I don't know that I can add anything. The former speakers have struck the right note in stressing the fact that quality of the product is the most important thing we have to deal with. A man who is producing quality will get paid for it. That fact has been well demonstrated at the Baltimore Livestock Show where our quality steers average high in price. If our packers and consumers in the East are willing to pay for quality then we should try and produce quality. Quite a deal has been said about purebred sires. I thoroughly believe that a man cannot produce quality without a purebred sire, and he must be a good purebred sire. We must look back to breeding of our sires to make sure that they have something behind them. We must also make sure that our dams are of good breeding. If you are going to produce quality you must have quality on both sides. You can't expect your sire to do the whole thing. In these days of relatively low market prices a man may well dispose of his cull animals and replace them with good ones. At the present prices we can buy really good cattle, sheep, and hogs at the lowest prices that we have ever known. I believe that if we will make a speciality of producing quality products in sheep, hogs and cattle in Maryland, we will come out all right. Our difficulty today, if we are producing ordinary animals, is that we are in competition with the vast majority of the livestock producers of this nation.

MR. W. S. CHICHESTER, Prince George's County: When I was in the cattle business in Virginia, many years ago, we handled quite a lot of cattle, but we handled them a great deal differently than we now handle stock. We did not put them under shelter; they had to "rough" it. Present conditions call for different methods, and if we are to succeed there are a number of things which should receive our attention. One of the first needs is to eliminate scrubs from our herds and flocks. After the animals are born, the quicker we can get them ready for sale the better off we are going to be. So far as the business of fattening thin

stock which we buy is concerned, the buying is more essential than the selling. We have to know how to buy. Common stock has always brought only common prices and always will. There are livestock lessons to learn every day on the farm.

CHAIRMAN JONES: Dr. DeVoe Meade of the University of Maryland will now close this interesting round table discussion.

DR. DEVOE MEADE, University of Maryland: The four speakers whom you have just heard have told of the importance of good inheritance, good feeding, and good management as means of improving the product and income from Maryland herds and flocks. I believe that a brief summary of the records made in eight years of the Maryland Litter Contest will be of interest to you.

During the past eight years, 1925 to 1932, inclusive, litter contests have been conducted annually within the State. The rules of the contest require that the pigs composing a litter shall weigh at least 1,500 pounds at 150 days of age in order to be eligible for prizes. The following tabulation gives some interesting information relative to the fifty litters which have been successful in reaching the required weight and which have been prize litters since the inauguration of the Litter Contest in 1925.

SIZE OF LITTER OF SUCCESSFUL ENTRANTS, 1,500-POUND LITTER CONTEST, 1925 to 1932, INCLUSIVE.

Number of Pigs Per Litter	Number of Litters	Number of Pigs	Per Cent of Litters Having Size Indicated
9	7	63	14
10	23	230	46
11	9	99	18
12	6	72	12
13	5	65	10
	50	529	

Average number of pigs per litter (50 litters) 10.58.
Five hundred and twenty-nine pigs in 50 litters had a total weight of 92,259 pounds.
Average weight per litter, 1,845 pounds.
Average weight per pig, 174.4 pounds.
Average weight per day of age, 1.16 pounds.

The fifty litters that were successful in reaching the required weight of 1,500 pounds or more contained a total of 529 pigs, having a combined weight of 92,259 pounds. Litter sizes ranged from 9 to 13 pigs. Ten per cent of all litters had 13 pigs per litter; 22 per cent had 12 or more pigs per litter; 40 per cent had 11 or more pigs per litter; 86 per cent, 10 or more pigs per litter; and 100 per cent, 9 or more pigs per litter. From the experience of the feeders of these fifty litters it is apparent that Maryland hog men cannot hope to obtain as much as 1,500 pounds of pork per sow in 150 days unless a sow raises at least nine pigs per litter.

The average number of pigs per litter for the fifty litters was 10.58. The average weight attained per litter was 1,845 pounds; the average weight per pig was 174.4 pounds; and the average daily gain per pig was 1.16 pounds. The heaviest litter weight attained was 2,796 pounds. This litter was composed of twelve pigs which had an average weight of 233 pounds and made an average daily gain per pig of 1.55 pounds.

From the experience of those Maryland farmers who have bred and raised these litters, there are several things which are apparently necessary for successful and profitable pork production. It is required that sows be prolific and raise large sized litters, as the evidence is that no litter having less than nine pigs reached a weight of 1,500 pounds at 150 days. Pigs need to be well fed on properly balanced rations in order that they may make rapid daily gains, and reach marketable condition at an early age, thereby lessening the costs of production through the saving of feed, labor, time, risks, etc.

While the methods of feeding practiced by the successful contestants varied considerably, they all agreed in that home-grown grains were properly supplemented with high-protein feeds, and that pigs were plentifully supplied with water, and kept under comfortable, sanitary conditions.

Another item of success worthy of note is the fact that

every one of the fifty litters reaching the goal required in the contest was sired by a purebred boar. The sows were in the majority of cases either purebred, crossbred, or grade. It is evident, therefore, that a strong inherited capacity to produce pork rapidly and economically must be obtained by the use of purebred boars and proper breeding practices.

In these times of stress and low prices it is necessary to reduce the cost of pork production to a minimum. Evidence obtained from the experiences of these successful Maryland hog feeders demonstrates that large litters of pigs, sired by purebred boars, out of good sows, fed a sufficient amount of well-balanced feed, and given proper care, will do much to lessen the costs of production, to decrease the hazards of pork production, and to insure larger profits from the enterprise.

CHAIRMAN JONES: The next in order is the election of officers for the coming year. Does the nominating committee have a report to make?

Thereupon Mr. J. Herbert Snyder of the nominating committee placed in nomination the following officers, who were unanimously elected:

President—J. W. Jones, Olney.

Vice-President—Charles T. Cockey, Jr., Pikesville.

Secretary-Treasurer—B. E. Carmichael, College Park.

Assistant Secretary-Treasurer—K. A. Clark, College Park.

Executive Committee—Edgar Zepp, Clarksville; E. T. Cullen, Port Deposit; H. P. Miller, Grantsville; J. Maguire Mattingly, Pearson; H. N. Cohen, Easton.

Director Maryland Farm Bureau Federation—W. R. Harvey, Corbett.

Delegate to Annual Meeting Maryland Farm Bureau Federation—Stanley P. Stabler, Spencerville.

PRESIDENT JONES: If there is no further business, the meeting stands adjourned.

REPORT

OF THE

Fourth Annual Meeting

OF THE

Maryland State Poultry Association

Wednesday, January 4, 1933

BALTIMORE, MD.

The fourth annual meeting of the Maryland State Poultry Association, held in conjunction with the Maryland Agricultural Society, Maryland Farm Bureau Federation, was called to order at 9.30 A. M. on Wednesday, January 4, 1933, with Mr. William V. Lauterbach presiding. He submitted the following report:

PRESIDENT'S REPORT

By WILLIAM V. LAUTERBACH,

Mt. Airy, Md.

Members of the State Association and Friends:

It gives me pleasure to call this meeting together. When I accepted the presidency of the State Poultry Association a year ago, I felt that I was pledging myself to do all possible for the advancement of our State Association. I had felt that we, in the past, had not been doing all that we could have done in the way of increasing our membership, but now that a year has rolled around, I have first realized what a task it is to do this little thing of increasing membership. The Board of Directors and other members who were

active during the past year have worked hard to accomplish the things that have been done to improve conditions for the poultry industry. We started the year with a program, which resulted in calling together, in different counties, poultrymen for meetings to organize County Poultry Association affiliated with our State Association. These meetings we held on the Eastern and Western shores and I regret to report that we were successful only in organizing one county, which was Frederick; it appeared that the other counties in which we held these meetings were not ready for organization and, while we feel that this was one of the best steps to take, we still have it in mind and will continue to organize the other counties just as soon as they are ready.

Our annual field day in June proved successful. A large attendance gathered at College Park for this meeting and an interesting program was presented which was very beneficial to all present.

Our Board of Directors met in the afternoon of this day and after a lengthy business meeting outlined plans to increase the work of blood-testing and certifying the hatchery flocks of the State. It was decided at this meeting that we reduce our charge for blood testing to 4 cents per bird. We felt that this step was going to help us considerably in the way of developing this work and, while during the year of 1931-32 there were but 30,000 birds certified and blood-tested, the year of 1932-33 will show a tremendous increase and it is expected more than 80,000 birds will be blood-tested before this work is complete. We have really sold the idea to the poultry breeders and hatcherymen of the State. This, we believe, has been one of the best pieces of work our State Association has accomplished recently. It means that eventually it is going to hold the business for our State hatcheries.

There are too many chicks being bought out of our State for the simple reason that the healthy chick could not be purchased here in large quantities. As time goes on and

the hatcherymen get all of their flock owners to blood-test their breeders, the broiler raiser is going to buy his chicks locally. Our membership is naturally going to increase as this work goes on and until it does get its fair proportion of the 40,000 farms in the State who raise poultry, we cannot set out to accomplish all of the things we have in mind for the benefit of our industry. The time is not far off when we hope, through legislation, to prohibit importation into our State of inferior quality and diseased chicks. We are making every effort we possibly can to clean up our State and, naturally, we are going to take steps to prevent diseased poultry from entering. There is hardly a person present here today who cannot honestly say and see the need for a strong poultry association. Our State should protect the industry for the poultrymen.

To the hatcherymen who have chick buyers that for reasons for which they are not responsible, are in such financial condition that they cannot buy baby chicks this coming season, they can render them a service and help by obtaining forms from the Agricultural Credit Corporation which will loan money for this purpose. I hope that they will take advantage of this opportunity.

The outlook for early 1933 broiler chicks looks very favorable to me; from all the information I am able to gather, I understand that sales in the eastern section are running 50 per cent under a year ago and likewise the bookings for future deliveries.

Egg prices have held out during the past year unusually good and it has been a long time since our market prices have held up so late in the season. However, it may be expected, that egg prices the coming spring will be unusually low; in fact, I believe, will be so low that the majority of hens will be sold off. This naturally will cause a larger shortage in the fall to follow. So my advice to those who can, is to plan to have their pens filled with producers by early fall.

In conclusion, I want to appeal to every member of our Association to solicit new members, as it is impossible for us to accomplish the necessary things for our industry without the support of every poultryman in the State. We want to try a new plan this year and that is to have each member sign up at least five new members and take part in selling the association to every one they come in contact with that is interested in poultry.

Following is a list of breeders and hatcheries that have had their poultry flocks certified, and certified and blood-tested under the official supervision of the State Association.

We recommend them to the buying public:

Ayrlawn Farms, Bethesda, Md.
Herman L. Altenburg, Bengies, Md.
H. H. Blanford, R. F. D., Marlboro, Md.
Becks Hatchery, Mt. Airy, Md.
S. F. Conner, Marion, Md.
Confidence Farm, H. D. Copeland, R. F. D., Anacosta, D. C.
Davis Hatchery, Preston, Md.
Eglantine Farm, Greensboro, Md.
Mrs. Choly Ennis, Westover, Md.
Mrs. Wayne Cawley, Denton, Md.
John W. Evering, Stemmers Run, Md.
S. J. Grimm, New Midway, Md.
G. Wm. Gardenhour, Smithsburg, Md.
Lloyd E. Holsinger, Del-Mar Farm, Denton, Md.
A. C. Hall, Marion Station, Md.
Edgar L. Hargett, R. F. D., Frederick, Md.
P. O. Hudson, Kingston, Md.
E. F. Hastings, Parsonsburg, Md.
Charles F. Hines, Olney, Md.
Mrs. W. W. Hopkins, Cordova, Md.
A. Hayes, R. F. D., Thurmont, Md.
Hooper Bros., Taylorsville, Md.
B. Herbert Howes, Fullerton, Md.
F. & B. B. Heinemann, Clear Springs, Md.
Sherman C. Kline, Mt. Airy, Md.
Mortimer P. Lee, St. Michaels, Md.
George A. Linne, Phoenix, Md.
K. D. Leather, Smithsburg, Md.
William V. Lauterbach, Mt. Airy, Md.
Lowell Loomis, Oakland, Md.
H. T. Langmaid, Greensboro, Md.
Maryland Chick Hatchery, Frederick, Md.
Britten Martin, Mt. Lake Park, Md.
H. D. McLean, West Friendship, Md.
W. F. Parrill, Old Frederick Road, Baltimore, Md.
George Parent, Rockville, Md.
Pioneer Point Farm, Centerville, Md.

J. H. Quillen, Preston, Md.
Edgar L. Thomas, R. F. D., Frederick, Md.
Gordon Umstead, Dawsonville, Md.
Vessey Bros., Rehoboth, Md.
George H. Vandermast, Stemmers Run, Md.
W. W. Walker, Mt. Airy, Md.
D. T. Walker, Mt. Airy, Md.
F. E. Williar, Mt. Airy, Md.
Wilbur L. Watkins, Princess Anne, Md.
J. A. Wilkins, Rehoboth, Md.
Princess Anne Academy, Princess Anne, Md.

The chairman then presented Dr. E. N. Pickens, Bacteriologist and Pathologist, University of Maryland, who made the following remarks:

PULLORUM DISEASE

By E. M. PICKENS,

University of Maryland.

For the benefit of the members of your Association who are not familiar with the organization of the certification and accreditation work, as it has been conducted during the past few years, the following brief explanation is offered:

The work is conducted on a co-operative basis between the Extension Service of the University of Maryland, the Live Stock Sanitary Service of the State Board of Agriculture, and your organization. The Extension Service has taken charge of and conducted the certification work. This consists in the culling of the flocks for type, production qualities, etc. The Live Stock Sanitary Service has taken the blood samples in the field for pullorum disease testing and has examined these samples in the laboratory.

During the past year, this work has been so heavy that the Live Stock Sanitary Service staff was unable to take all of the blood samples within the time alloted. In this emergency, the Extension Service supplied the additional assistance required.

The Maryland State Poultry Association, as you all know,

has sponsored both the certification and the accreditation activities. It has also materially assisted in both projects, and has acted as the certification and accreditation agencies.

You are certainly to be congratulated on the growth of the pullorum disease work. The following figures tell the story in a very definite way:

In 1927-8	there were	3,597	birds tested.
In 1928-9	there were	4,452	birds tested.
In 1929-30	there were	6,008	birds tested.
In 1930-1	there were	16,392	birds tested.
In 1931-2	there were	26,615	birds tested.
In 1932-3	there were	87,000	birds tested.

It may, therefore, be seen that this work has so outgrown our staff of employes that a new system will have to be devised for procuring the blood samples next year. Your officers and the Live Stock Sanitary Service officials are now studying the situation. It is hoped that a plan will soon be worked out that will enable us to carry on this project with continued increases.

The pullorum disease testing is now on a firm basis, as far as results are concerned. This means that the baby chicks from tested flocks are remarkably free from pullorum disease. With the continued growth of the work the methods of handling the flocks will have to receive more careful attention, if we are to continue to advance.

For you flock owners and hatcherymen, the work will consist in following all directions very carefully in regard to preventing spread of the disease. You should have a large number of accredited flocks in the State. This means strict sanitation, addition of healthy stock only, short interval testing and the prompt removal of all reactors and suspicious birds.

At this point Dr. L. F. Roetger, Department of Bacteriology, Yale University, delivered the following address:

PULLORUM DISEASE, A CHALLENGE TO OUR BEST EFFORTS

By LEO F. RETTGER,

Yale University and

Storrs Agricultural Experiment Station.

No subject in the poultry world is today eliciting more interest than pullorum disease. The disease was recognized as early as 1899, when the speaker described the causative organism and demonstrated its peculiar infective property.

The poultry industry must either resign itself to an inevitable fate, or take drastic measures to forestall losses accruing from this disease.

Pullorum disease has for many years been recognized as affecting young chicks primarily. However, it is now well known that the chick phase is only one cycle of develop ment and spread. The complete cycle may be described briefly as follows:

Chicks which recover from an epidemic frequently develop into producing hens that become permanent carriers of the disease as a result of localization of *Bacterium pullorum* in different parts of the body, particularly the ovary. Eggs laid by such hens are frequently infected, and when used for hatching purposes bring forth infected chicks, unless death from the disease takes place in the shell. The infected chicks spread the disease to other chicks through the droppings. Survivors of the epidemic become potential carriers of the infection, and thus the cycle is repeated.

The disease may be spread also from one adult bird to another. Hence, the harboring of *Bacterium pullorum* infection on any poultry plant is a constant menace to the entire stock.

The logical way to break the cycle of infection has been found to be the elimination of infected breeders, and the

most reliable and practical method of detecting infection in breeders is the agglutination test as it has been standardized quite recently and is being used over a large part of this and other countries.

The aim of any definite control system should be complete eradication of a disease, by systematic blood testing, removal of all infected birds, and prevention of introduction of the disease from the outside.

A definite system of accreditation has been adopted in various States, and has resulted in very material progress towards eradication of the disease. Accreditation should be established only on the most scientific and rigid basis. The testing should be done by thoroughly competent official technicians, and the control phase should be in the hands of a responsible official agency, preferably a State department.

Poultry associations can do a great deal to bring about the inauguration of such a system of testing and control. In certain States where well organized and active associations have been in existence for some time, much has been accomplished in campaigns to control and ultimately eradicate pullorum disease through the efforts of these associations. Indeed, so keen has the interest been in some sections, and so much dependence been placed on eradication, that the poultry industry would bitterly oppose any attempted move to deprive them of the advantages of the official serological test and officially regulated control system.

At this point various matters pertaining to the business of the Association were discussed.

The following amendments to the constitution and by-laws were adopted:

Amending Article III of the Constitution.

Section 2. In addition to the regular elective Board of

Directors as provided in Section 2 of Article III, each County Poultry Association that is affiliated with the State Association, and pays Association dues as such, shall have one member on the Board of Directors of the State Association. This member must be either the President or Secretary of the County Association and must also be an individual member of the State Association. This member of the Board shall be chosen by the members of the County Association prior to the first day of January of each year and his term of office shall be one year. The State Association must be notified of such election before January 1 of each year, and the name and address of the member so elected and the office he holds in the County Association must be given the State Association.

Amending Article II of the By-Laws.

Section 1. The annual dues of individual members residing in counties where there is no affiliated County Poultry Association shall be two dollars per year, payable in advance on or before the first day of September of each year.

In all counties where there is a County Poultry Association that is affiliated with the State Association and pays their annual dues of five dollars per year, as such, all members of said County Poultry Association whose dues are paid up in the County Association have the privilege of joining the State Association by paying to the State Association the sum of one dollar annually on or before the first day of September of each year. This one dollar State dues may be paid to the secretary of the County Association and by him forwarded to the secretary of the State Association, who shall issue the State Association membership card to said member.

SECOND SESSION

January 6, 1933

The meeting was called to order at 9.30 A. M.

Mr. S. B. Shaw, Chief, Maryland State Department of Markets, made the following remarks on "A Plan of Co-operative Marketing for Maryland Poultry Products":

A PLAN FOR CO-OPERATIVE MARKETING OF MARYLAND POULTRY PRODUCTS

By S. B. SHAW,

Chief, Marylad State Department of Markets.

An outstanding piece of extension work during the past year has been the co-operative marketing of eggs of Prince George's County.

A survey conducted by P. A. Raper of the Extension Service indicated that eggs of high quality could be profitably marketed in Washington. A small group of commercial egg producers in the nearby section of Prince George's County became interested in this possibility and after discussing the situation with their county agent decided they would attempt to market their eggs collectively rather than through individual effort, even though in the beginning they might receive a few cents less per dozen for their product. With this end in view, County Agent P. E. Clark arranged for a conference of this group with the poultry and marketing specialists of the Extension Service for the purpose of discussing ways and means whereby this work might be most successfully projected. These producers had the general marketing situation of Washington well in hand and were thoroughly conversant with the existing outlets and methods of distribution.

Their first thought was to put up a strictly graded pack

of eggs employing their own sales agent to sell either in Washington or on the New York market, the cost to be deducted from the price received. After several conferences they were finally persuaded to abandon this idea and seek an outlet for their eggs through existing channels of distribution. Accordingly, they contacted a distributor who for a number of years had been selling butter in Washington under his own brand and trade-mark and who had been considering the marketing of eggs under the same brand on the basis of Government grades.

This distributor appeared willing to try the experiment and agreed to handle not more than twenty-five cases of eggs per week, the eggs to be graded and certified by a qualified inspector, packed in cartons which would be sealed, and carry his trade-mark. The producers agreed to accept for these graded eggs two cents under the New York market price for the different grades.

In considering the type of organization into which they would form themselves, the producers decided on that recommended by the Federal Farm Board. Consequently, they so organized and adopted the prescribed forms of agreement which each member had to sign in delivering his product to the co-operative.

A receiving station, easily accessible to the majority of the producers, was established close to the District line. A Federal licensed inspector was employed under a co-operative agreement between the State Department of Markets of the Extension Service and the Bureau of Agricultural Economics, United States Department of Agriculture.

On May 25 the first delivery of eggs was made from the grading station to the distributor and the price received was 17½ cents per dozen, which was 2½ cents above the quotation on the Washington market. Before the end of the first week the demand for these eggs increased to fifty cases, which was double the amount agreed upon. This demand has continued.

In beginning to market graded and certified eggs, the distributor used the same brand on his carton that was used in marketing his butter, but in addition included the statement that these eggs are the product of the Maryland Egg Producers, Inc. In his advertising through newspapers and over the radio he carried this same information. The Extension Service co-operated in preparing inserts containing timely information in regard to the healthfulness of eggs in the diet, recipes, etc., which were placed in each carton as packed, thus advertising direct to the consumer. Each carton as packed was closed with a seal, indicating that the eggs contained therein had been inspected and certified by a qualified inspector representing jointly the United States Department of Agriculture and the Maryland State Department of Markets of the Extension Service. This seal bore the date on which the eggs were packed, thus assuring to the consumer the purchase of a strictly fresh quality product.

As indicated, the price received for the first lot of eggs showed a spread of 2½ cents per dozen between the prevailing price on the Washington market and the price of the certified product. As this undertaking progressed and the quality of eggs became better known the demand again doubled and continued to double with a corresponding spread in price, so that by the end of the thirty-first week there was a difference of ten cents per dozen in price which the Maryland Egg Producers were receiving for their quality eggs and the top quotation on the Washington market. The average price for all grades of eggs sold by them at the same time showed an increase of 4 cents over the top quotation for other eggs on this market.

An interesting feature in connection with this marketing project is the fact that all members of this co-operative believer that they were producing and delivering to their trade eggs of superior high quality. When these eggs were first examined and analyzed by the inspector it was found

that the quality was not so good. Approximately only 25 per cent were top extra and special quality.

Following recommendations of the county agent and the poultry specialists, changes were made in the feeding of the birds and the handling of the eggs, with the result that in a short time eggs were being delivered which graded 50 per cent top extra and special quality.

This improvement in production and handling is reflected in the increased price which has continued to be received for the top grade eggs, and has also been responsible for maintaining a higher level in the average price of all eggs sold by the organization.

It will be borne in mind that while this co-operative was set up on the same basis as practically all co-operatives, the outstanding difference is in the methods used in carrying out the sales operations. Through the advice and recommendations of the Extension Service this group did not set up their sales agencies nor incur the expense of employing a sales manager, but they did, however, take advantage of a local condition which enabled them to carry on their sales activity and methods of distribution through an existing agency with sales outlets already established. This has enabled the organization to carry on its operations at the lowest possible expense to the producers, thereby aiding them in obtaining for their product the maximum net returns.

Since May 25 over 50,000 dozen eggs have been marketed through this Association, the sales value of which has been over $12,000, and which represents an average of four cents per dozen more than these producers would have received for their eggs had they not been marketed in this manner.

Dr. Justin Andrews, Associate Professor, Department of Protozoology, Johns Hopkins University, then made the following report:

REPORT

DR. JUSTIN ANDREWS,

Johns Hopkins University.

Four lots of 250 White Leghorn chicks, two weeks old, were housed and managed as nearly identically as possible except for sanitation and chemical treatment of litter. Two lots were placed on clean litter in pens which were cleaned each week. One of these pens was sprayed each week with a mixture of coal-tar acids in a light mineral oil (Toxite); the other was not. Two lots of birds were placed on dirty litter in pens which were deliberately contaminated by the addition of 8.5 pounds of oöcyst-containing (mixed species) litter to each. One pen was sprayed each week with the mixture mentioned above; the other was not. The treated pens showed significantly lower mortality rates, more weight and greater food consumption. An experiment was conducted repeating essentially the conditions in the two latter pens (poor sanitation of the first experiment. The results confimed the findings of the first experiment. It was further determined that in the absence of cleaning, this chemical mixture would not protect the flocks against epidemic coccidiosis for more than four weeks. A pen treated with a mixture of the same quantity of coal-tar acids emulsified in water failed to postpone the normal development of a coccidial outbreak.

Prof. Roy H. Waite of the University of Maryland was then introduced. He made the following address:

RECENT EXPERIMENTS AT THE POULTRY EXPERIMENT STATION, UNIVERSITY OF MARYLAND

By ROY H. WAITE,

Professor of Poultry Husbandry.

Facts are the working tools of the investigator. Facts are cold unemotional things. They do not have the quality of sympathy. They maintain a sort of take it or leave it attitude. There is little of salesmanship inherent in facts.

Facts that line up with and justify our actions and ideas are agreeable to us. Facts that are out of line with our present ideas are less agreeable. Often we are openly antagonistic. However, it is by taking on new facts and adjusting them to our present knowledge that we learn. A few years ago in discussing some class problems with one of our poultry students I make the remark to him that the acquiring of knowledge, learning in other words, was usually a painful process. And so it is. It requires mental effort to study and understand and classify new ideas or facts.

In addition, in the case of us older persons at least, most of us have the task of climbing around, figuratively speaking of course, in our own storage warehouse of facts, and adjusting and sorting and re-classifying, each time that we have the necessity to make room for a new idea. It is hard, difficult, laborous work, this tugging, shoving, lifting and shifting our ideas about. Instinctively we shrink from the task. We are mentally lazy and it is probably well for humankind that we are not too ambitious mentally, a little hesitancy here tends to make for stability. It gives time to more completely go through the necessary mental adjustments and make further study of any sidelines to the particular problem at hand.

But, if progress is to be made in the development of human affairs, adjustments must be made. Civilization has gone a long way since man first learned to co-operate for mutual individual benefit. There is still plenty of room for development, but as we go along and our structure of civilization gets more and more complicated we must exercise greater and greater care in making our adjustments, lest we pull the whole structure down upon our heads.

Stated in another way, the more facts we have to deal with the more careful we must be in adjusting these facts and making up our conclusions.

I can readily recall the day when science (organized knowledge) played but a very little part in the affairs of

the poultry world. Grandfather's ways were the approved ways. It is easy to recall the time, not so far back, when a man's veracity was seriously questioned for venturing the information that it was possible to breed a pullet to lay two hundred eggs in a single year. Just a few days ago I was reminded of times not so far back when a party seeking information as to the cause of trouble in his brooding advanced as a possible theory the fact that the chicks were incubator hatched. Incubator chicks were not thoroughly established in the public confidence until along about 1910, when Pearl pointed out that eight or ten successive generations of breeders had been artificially hatched on a large scale in the breeding experiments carried on at the Maine Station at Orono. Dr. Ruttger, who talked to us yesterday, spent many years and much energy convincing poultrymen that a bacterial organism was capable of producing the disease of chicks commonly known as white diarrhea.

It is sometimes enlightening to look back momentarily at the road over which we have come. It gives us perspective and heartens us for the new tasks to be encountered. As I have intimated previously, there was a time not far back when science played a small part in the affairs of poultry raisers. For a considerable period of years a vast amount of scientific information accumulated in the literature of the day, unused by the practical poultryman who was afraid of it. All this changed suddenly along about 1915 when the intensive Extension Service movement very quickly brought the material out of storage and popularized it. For a number of years now the poultry industry has faired well in using this information. Of course, much of the information was better for the aging it received. Time has a way of mellowing and softening and strengthening ideas. The industry was not under the necessity of using raw ideas.

The industry made use of the information and liked it. Not many had any clearly definite idea of where the infor-

mation came from. Some who did know were inclined to blame the investigators who had builded much of the material for not having previously given it sufficient publicity. Even to this day investigators are often criticized for not getting their information out fast enough. The average person does not realize sufficiently the necessity for extreme care in testing and trying, examining and re-examining ideas before they are safe to pass on to the public. They do not sufficiently realize that when we make one important change in our system of management it is necessary to go all up and down the line, examining for the effect of the change on the multitudinous other items involved in management. Now that poultry raisers have taken so kindly to scientific knowledge the pendulum seems inclined to swing to the opposite side of the picture. Right now poultrymen have just about the same degree of contempt for grandfather's ways as they had love for it in the earlier days.

The demand for new knowledge and new methods is so great that at the present time it sometimes seems as though the whole poultry industry is one big experimental laboratory. Every one is looking for something new and startling. Half-baked ideas are grabbed, hot, right out of the pan.

Private industry is active in the field of research, which is more or less of a new condition in agricultural lines. And, let me not be misunderstood, private industry is doing a lot of good work. But private industry has to cash in quickly on its research. It is also a limitation that private industry cannot gain a reward for negative results in its research, except in a very indirect manner.

The tendency is for the results of investigation by private industry, or other investigational agencies for that matter, to be quickly taken up and put to use. The more novel and striking the idea, the more boldly it strikes off in a new direction away from the old trodden trail, the more eagerly it is taken up by the poultryman. When the road leads into difficulties, there is no thought of turning back. The poul-

tryman plunges wildly about seeking a way through the short cut that he has just undertaken.

It naturally devolves upon us who are engaged in institutional work to do a lot of trouble shooting for our constituents. More and more has it been impressed upon us, that a great majority of poultry raisers who bring in their troubles are persons who have started on a short cut, a new road being builded through the wilderness, but only partially completed, and they have lost their way. Of course, the logical advice to give in such a case is to go back to the old road, which may be a little longer, but still a road that runs through to the destination. Usually, however, it is a long way back to the old road and there is no place to turn around. The only way to get back is to wait until next year.

Then, too, we meet with a lot of determination on the part of some, commendable of course under proper restraint, to want to continue the journey somehow. They may not want their neighbors to see them backing up, or they have seen some one else go through the unbeaten trail, possibly by exercising skill or perhaps by a good run of luck. If we try to put them back on the old road, then in their minds we are behind the times, they lose confidence in us and to them we are not up on the latest information. It makes a very difficult problem. Of course, we try to do everything that we can to open up the new cuts. But there is a limit as to what is profitable from a public standpoint. There is no profit in wasting energy in blazing new trails to parallel old ones, and the amount of traffic must be taken into consideration in selecting the important roads to be improved.

In our investigational work at the University in College Park, we are greatly hampered in selecting the problems on which to devote attention by the limitations of our facilities. We try to pick problems as they confront our poultry raisers. We have as our motto or slogan or working objective, whatever you call it, "Our first concern is for the man who is

actually raising the chickens. He is the hub of the whole poultry industry." Naturally we are limited to problems that we have facilities to handle. Sometimes we explore blind alleys and get negative results. Often such research is more valuable than that giving positive results, but we get little credit for this type of work.

Often we are busy, and our facilities taxed with previous problems, when new ones come up. We can hardly afford to throw a partially completed piece of work away to take up a new one. Often a situation is changed so that the results do not apply, or a problem vanishes. Our gape worm research conducted several years ago is a case in point. I think this was a very good piece of work, at least, it was very carefully done. But shortly after the time of publication the disease disappeared as an economic factor thereby turning our research results to academic rather than practical value. The "feeling method" of taking individual egg records is another example. Short after collecting a lot of data on this subject emphasis was put on egg size in breeding work and the field of application for this research was very materially limited.

Recent investigations that may be of interest may briefly be summarized. Time does not permit of full discussion.

Investigations regarding cement poultry house floors are described in a bulletin which came from the printer a short time ago. Comparative temperature readings taken at various seasons showed that a cement floor has a warming effect on temperature in extreme cold weather and a cooling effect in hot weather. Description of a method for insulating against moisture by use of straw is described.

Another publication, one just recently sent to press, gives the results of a salt feeding test on baby chicks up to nine weeks of age. A remarkable and unsuspected tolerance for salt was observed. The results are principally important in the bearing that they have on other research, but from a practical standpoint it was interesting to learn that chicks

could withstand as much as 30 per cent of salt in their feed for short periods of time without apparent serious effect. The protecting factor seems to be lack of palatability, and, heavy consumption of water.

We have some very interesting results in connection with sanitation in brooding. For a number of years I have entertained the idea that there is an opposite approach to the problem of sanitation than the one usually advocated. In the spring of 1932 we gathered samples of soil from some of the abandoned laying contest yards, selecting those that had given most trouble from disease, and taking soil most likely to have maximum contamination. This soil was well mixed, placed in a shallow box, and put into a brooding compartment where newly hatched chicks were brooded. Conditions were made severe. The water dish was placed on the dirt and chicks encouraged to pick. Slight loss occurred during the first few days due to chilling as the electric brooder did not rate sufficient heat capacity for a cold room. After the first few days the mortality was zero. Chicks were moved out doors later and at an early age were ranged on the abandoned yards of the contest grounds, their shelter being placed in a low place where sanitary conditions were at their worst. Most of the summer the chicks obtained their drinking water from abandoned post holes where surface water collected after rains.

The chicks thrived and developed normally. Later we repeated the test in a more controlled way. Results seem to indicate that chicks quickly develop tolerance to land-borne disease, if exposed to it at an early age. The lesson that we get when comparing these results with other experiences seems to be that what we need in poultry work is a "balanced sanitation." If we start chicks out under strict sanitary conditions it seems imperative that they be kept under these conditions throughout their entire life. If chicks at any later stage of their development, even as adults, are to be exposed to contamination, it would seem to be the part of wisdom to expose them at the very start.

At this stage they seem either to have special powers of resistance to contamination, or they consume infectious material in such minute quantities that it acts as an immunizing agency, much on the principle of vaccination. Chicks that are reared under super-sanitary conditions are likely to be constantly menaced by the spectacle of contamination hanging over them. A specially dangerous time seems to be when the grown pullets are moved from the brooding range to the laying quarters.

We are also getting some very interesting results in our investigation of the inheritance of resistance to pullorum disease. Originally started as a demonstration of pullorum disease elimination by culling, we quickly detected a tendency to variation on the part of individuals to resistance and switched our project over to a breeding investigation. We seem to have established the fact that there is resistance, and that it seems to be inherited. At the present time we have two lines of descent in our stock which show a remarkable degree of resistance. We also carry a third line for reserve.

Some indication of the progress we have made is obtained from the fact that mortality has dropped off at so rapid a rate as to make us despair somewhat of being able to keep infection in the flock, to insure the contact necessary to check on the resistance power of the principal birds.

REPORT

OF THE

ANNUAL MEETING

OF THE

Maryland Tobacco Growers Association

January 6, 1933

BALTIMORE, MARYLAND

A meeting of the Maryland Tobacco Growers' Association was held with the Maryland Farm Bureau Federation at the Lord Baltimore Hotel on January 6, 1933.

This meeting was called to order by the Honorable Clarence M. Roberts, chairman, a director of the Association from Prince George's County. He gave a very interesting discourse on the problems confronting the Association from a co-operative standpoint.

Honorable Thomas Parran, president of the Association, was the next speaker on the program. He discussed what the Association could accomplish in the stabilization of the price of Maryland tobacco if there were greater loyalty on the part of members to support their organization.

Mr. Parran has been president of the Association since its organization in 1919.

The next speaker on the program was Dr. F. B. Bomberger, chief of the Division of Co-operative Marketing of the Federal Farm Board, but owing to the fact that he had been called before the Committee of Congress on the day of this meeting, he was unable to attend.

Mr. George I. Gardiner, general manager of the Association, then made his annual report for the calendar year of 1932. It showed that the Association had the most successful year from an operating standpoint since its organization in every field of its activity, but that economic conditions prevailing at this time would prevent the Association from rendering the same financial assistance to its members as it had in the past several years. Also that because of the prospective cigarette war, the price at which Maryland tobacco would sell in 1933 would be affected by the price for which the big four cigarettes would sell in 1933.

Chairman Roberts brought to the attention of the meeting a proposed bill submitted to the Maryland Legislature now in session to place a State tax on manufactured tobacco. He called upon State Senator, the Honorable J. Allen Coad, to express his views on this question. The Senator delivered a very convincing address, in which he stated that it was his belief that a State tax would react to the detriment of the tobacco producers of Maryland.

A vote was taken of those present at the meeting on the question of the State tax on tobacco products, and there was a unanimous vote against such a proposition.

REPORT

OF THE

Home and Community Committee Meeting

Maryland Farm Bureau Federation

January 5, 1933

BALTIMORE, MARYLAND

MRS. ROY WEAGLEY, Secretary

The tenth annual meeting of the Home and Community Committee was called to order at 10 A. M. on Thursday, January 5, 1933, by the chairman, Mrs. Harry T. Williams.

Many counties were well represented by the Farm Bureau women. Fifteen of the home demonstration agents and their State leader, Miss Venia M. Kellar, of the Extension Service, were present.

Meeting opened with song, "America," followed by the Lord's prayer.

Minutes of the last meeting were read by the secretary, Mrs. Roy C. F. Weagley, Washington County.

Mrs. John Hale, Baltimore County, was the first speaker. She gave in minute detail the "Value of the Family Garden." Besides the monetary value, she stressed the importance at all times of having fresh vegetables, either raw or canned, for the health of the family.

The farm to home co-operative market in Montgomery County was described by Mrs. Julian Waters, Germantown:

SUMMARY OF REMARKS

By MRS. JULIAN WATERS.

Due to the proximity of Montgomery County to Washington, Baltimore and vicinities, the Home Demonstration Clubs of that county had been planning a farm market for sometime, which came to fruition with a Sales Day in January, 1932. The Federation of Women's Clubs of Montgomery County assisted with this project. With the help of the Extension Service a standard was set for each class of articles and the women must sell only products that reach this standard. Also a price was agreed on for each article. This proved so profitable that the market was opened two days a week, Wednesday and Saturday.

Dairy products, poultry and fruits proved best sellers, though home-cooked and canned products are very popular. By June the business was averaging around $1,000 a week with 81 farm women participating.

In August a reorganization developed into an "Incorporated Co-operative." A new building was constructed for this co-operative and we moved on December 2. Each seller pays one dollar a month rent and 5 per cent commission on all sales; also owns two shares of stock in the co-operative. A number of women have specialties, such as brown bread, rye bread, lemon tarts, etc. The sellers are all hard workers, enjoy their work and welcome visitors at all times.

A farm woman's market along the Georgetown Road, Montgomery County, was also reported.

Mrs. Joshua Fowble, Baltimore County, gave the following review of the annual convention of the American Farm Bureau Federation in Chicago:

THE NATIONAL FARM BUREAU CONVENTION

MRS. JOSHUA A. FOWBLE,

Reisterstown, Md.

Madam Chairman and Ladies: A trip to the National Farm Bureau Convention is certainly an inspiration. When one sees the activities of the women in the West, it makes her feel that we Eastern women do so little.

The convention opened with a memorial service for Mr. J. W. Davis, as a director, and all Farm Bureau members who had died in 1932. Mrs. Sewell, our National Home and Community chairman, placed a wreath in Mr. Davis' vacant chair, after which a large green wreath was placed before the speakers' stand and someone from each State asked to put a white carnation in it in memory of the ones who had died from their State. I was asked to put the first one in at the top in memory of Mr. Davis, also one for Mr. Payne. Others placed flowers until 14 had been put in.

The president gave a most interesting address, in which he stressed reorganization. The Home and Community chairmen drew up a resolution asking that a farm woman be appointed in the Department of Agriculture, either as Secretary or Assistant Secretary, a woman interested in agriculture or agricultural development. Mr. O'Neal said the farmer who co-operates gets the benefit and those who will not or do not, cannot expect to. The Farm Bureau has been the only organization which has sponsored a national rehabilitation program.

Mr. Sattler of Ohio, head of the county agents, said they had assisted in setting up in each State a farm organization some seventeen years ago, before Farm Bureau time, so they have always worked hand in hand.

Mr. O'Neal said there must be a tariff for all or a tariff for none and also have an equal competitive tariff for both industrial and agricultural products.

The Farm Bureau has brought forth leadership through which only success will come, said Dr. Simmons of New York.

Dr. Warburton said it had only been possible through the Farm Bureau to carry out their program of helping farm homes.

Never before has the social side of families or communities been so stressed to help people meet the hardships and to occupy their minds and never before have the State and county organizations done or had the chance to do such a wonderful job.

One thing that was impressive at the convention was the marching in of the directors, preceded by the national flag and the Farm Bureau colors. That ought to be something for the Farm Bureau women to work for, for their respective counties.

Maryland was honored by having its acting president, Mr. Massey, elected to the National Board of Directors to fill out Mr. Davis' unexpired term.

One day there was a lovely luncheon for the Home and Community State chairmen, and as our State chairman was not there, I had the pleasure of attending it.

An interesting feature was the contests sponsored by the Home and Community Department, one for public speaking. There were six contestants, the subject being "The Farm Woman and Her Civic Responsibility." Each dealt with her responsibility in the home, church and community, but it was most interesting to hear their different ideas of her civic responsibility. I hope Maryland can send a woman to enter this contest in 1933, for I feel sure Maryland has someone, or many, who could compete very favorably and bring the prize back to Maryland.

The second contest was for a quartet of male voices, five quartets competing. Perhaps many of you heard the broad-

cast of the "National Farm and Home Hour" on Tuesday of convention week broadcasted from the hall; the prize speech and quartet were presented. There were also several fashion shows, which women always enjoy. The men also seemed to enjoy them.

On Tuesday evening there was a banquet and dance which was enjoyed by all.

President O'Neal's closing remark, I think, would apply to each and every one of us:

"Be strong and courageous,
Be not discouraged, for God is always with us."

Miss Martha Manahan, nutrition director, Baltimore Dairy Council, with the aid of stereopticon slides, told "How to Keep Well and Live Long":

SUMMARY OF REMARKS

By MISS MARTHA MANAHAM.

A well-balanced diet is essential to keeping well and living long on this earth. This means a diet of the proper proportions of protein, starches, sugars, fat, minerals, such as calcium, phosphorous and iron. In these days, the old friends in the vitamin class, A, B, C, D, and some new ones recently discovered must be provided in some of their many forms. Milk is considered the best "all around" food for either children or adults. Thomas Edison, at the age of 80, said, "The Almighty knew His business when He apportioned milk. He is the best chemist we have."

Dr. Dutcher of Penn State gave this advice in verse:

"So now when you dine, remember these lines,
If long on this earth you would tarry,
Just try to be good and pick out your food
From the orchard, the garden and dairy."

Along with the use of proper foods go hand in hand, plenty of fresh air, plenty of sleep, and keep the body clean, inside and out.

To the disappointment of all present, Mrs. Charles W. Sewell, home and community director, American Farm Bureau Federation, was, owing to a conference in Washington, unable to take her place on the program.

Dr. J. H. M. Knox, Jr., Chief of the Bureau of Child Hygiene, Maryland State Department of Health, spoke as follows:

CONSERVING OUR MOST VALUABLE PRODUCTS

By J. H. M. KNOX, JR., Ph.D., M.D.,

Chief, Bureau of Child Hygiene,

Maryland State Department of Health.

I appreciate very much the privilege of addressing the Home and Community Committee of the Maryland Farm Bureau Federation. I understand this Federation is concerned with all methods which will lessen the loss and improve the value of the various products of Maryland farms. In the few minutes at my disposal, I should like to allude to the most valuable crop in rural Maryland and point out the importance of more thorough-going methods of conserving it. I refer to the children born on our farms and in our towns in the counties of the State.

Not long ago from 25 to 30 children were born in the counties of Maryland to every 1,000 population; in 1932 this number had been reduced to 17. This fact makes even more imperative the saving of all the children born and the improvement of this most important crop. It is generally conceded that the rural American child is the very foundation of the life and future of the country. Not only is his mental and physical well-being necessary to the farm and

small town, but the young men and women who move from the counties to our cities contribute largely to the prosperity of these large thriving centers of population.

The rural child in Maryland represents the product of our best American stock and every effort to conserve and strengthen rural child life is more than worth while. I should like to allude briefly to three losses which are occurring annually in the counties of Maryland—losses which can be, to a large extent, prevented if the people in each community really care:

1. Loss of lives of mothers.
2. Loss of lives of infants.
3. Loss in health and vitality of pre-school children.

In 1931 71 mothers in the counties of Maryland died from some complication of child-bearing. Most of these women lived on farms and in small communities; 27 of them died leaving older children, and the mother's death meant the orphanage for the older children, often the breaking up of the home, and usually the death of the new-born baby.

Doctors are all agreed that the expectant mother should be under medical supervision throughout her waiting period and have clean, skilled attention at her labor.

The great reduction which has taken place in recent years in the deaths of young infants has occurred in gastro-intestinal disorders. In the country at large only 12 per cent of all deaths under one year are now due to this disease. Not many years ago it was 30 per cent, yet, in the counties of Maryland last year deaths from gastro-intestinal disease accounted for 25 to 40 per cent of all the deaths under one year. Surely this is an unnecessary loss and is explained by the fact that the average rural child is not taken regularly to its doctor to have its feeding, clothing and daily regime directed, that there is not satisfactory care of the milk used in infant feeding and that many children become

infected through negligence in protecting them from house-flies. I appreciate that these infant deaths do not occur among the children of this group of women, but does not your group have a responsibility to see to it that your less fortunate sisters place their children under medical direction, nurse their babies at the breast, if possible, and when necessary, learn how to prepare the milk for infant feeding, protect their children from house-flies and, in general, give them the same kind of care that you would give to your own children.

In the city of Baltimore every poor mother, by walking a few blocks, can find either a hospital clinic or an infant welfare station where she can have her baby examined by a doctor and secure preventive advice. There is no reason why in every community in the counties a time and place may not be made available where similar assistance to the indigent mother may be rendered.

The loss in vitality of the pre-school child: The importance of medical supervision of the young child after infancy and before the school period is not generally appreciated. Upwards of 70 per cent of the children of rural Maryland are more or less interfered with in their development by the presence of some physical handicap. Many of these handicaps are either preventable or curable. Nearly all of these abnormalities, whether they be enlarged tonsils, bad posture or under-nourishment, etc., develop gradually and can be detected if the child is properly examined. This is the time, too, when habits are formed which may continue into the school period and even through life. How important, therefore, that the parents of these children should be properly advised.

"No mother in my community without adequate and early care, no infant without medical supervison, and every run-about physically fit for the long journey in school" is a practical program.

Professor Dewey of Columbia has said: "What the wise

parent wants for his own child, that must the community want for all its children."

When any community in Maryland really wants to save its most important crop, the desired result can be accomplished.

Chairman Mrs. Williams said, "We need organized efforts to accomplish that which Dr. Knox advocates; and it is our duty to take an active part to improve conditions of the less fortunate about us; whenever we cut the health budget, it increases the expense, because we will have to care for them anyway."

Officers were then re-elected to serve another year.

REPORT

OF THE

Boys' and Girls' 4-H Club Conference

January 4, 1933

BALTIMORE, MARYLAND

Attendance at the 4-H Club Conference has grown to a proportion that required the use of the Lord Baltimore Hotel ballroom this year. The meeting was called to order by E. G. Jenkins, State Boys' Club agent. He said that the potential leaders among Maryland farm youth had for years been going to cities to find worth-while jobs; now they cannot find jobs in the city. "Whether they like it or not, Maryland rural youth must live on farms for the next few years."

Miss Dorothy Emerson was then presented as chairman of the meeting.

MISS EMERSON: Before we ask Dr. Baker for his paper, I think we might talk a little about how we feel among ourselves on the farm situation.

What do you feel about Maryland youth? Our youth probably have planned to go to college and normal school and enter into business life. Their dreams aren't going to be carried out. That means they will have to stay where they are. What are you going to tell them when they ask you about the future?

The delegates then discussed the present world financial status and its relation to the farm youth of Maryland.

While some are not fitted for farm life, most of those present were unanimous in feeling that for themselves life on the farm presents an opportunity and a challenge.

Dr. O. E. Baker, senior agricultural economist of the United States Bureau of Agricultural Economics, spoke on Farming as a Life Work.

He first gave five reasons why he hopes his son will decide to be a farmer when he grows up.

1. A farmer has more and better food to eat than have most people who live in cities.

2. He has better health and lives longer.

3. He accumulates more property—becomes a wealthier man.

4. He is more likely to enjoy his work than are most city people.

5. He is more likely to rear a family and do his part to promote the future welfare of the nation and of the world.

Dr. Baker said in part as he elaborated on these five points:

1. It has been found by the Bureau that farm families of the United States have a better diet than working men's families living in the cities. Especially is this true during times of economic depression and unemployment like the present. It is with reference to clothing, and equipment of the house that farm families live more poorly than do city families, according to Dr. Baker's study. The poorer clothes you are likely to wear are not important and the comforts and sanitary facilities of a modern home you can have now on the farm if you are reasonably successful in farming.

2. The farmer lives longer despite the poor sanitary facilities in the average home, and there is less sickness

among the farming population than among the city population.

3. While it is difficult to prove that the farmer accumulates more wealth, the following facts indicate the probability. The States with highest per capita wealth are dominantly rural States. (South brings an exception because of negro factor.)

The distribution of wealth is more unequal in cities than on farms. Wealth in the city is in no small measure the result of chance, a gamble by millions of people for big stakes in which a few thousand win. Wealth in the country is normally the result of hard work, managerial ability and thrift.

4. For the farmer who realizes the significance of his work I believe there is no occupation that affords more substantial enjoyment. The farmer deals with plant life, animal life and human life.

5. The farmer has a fuller home life, and home life is the great need of the nation today. The cities are leading the nation down the same path of depopulation and decline that the Roman Empire followed nearly two millenniums ago. If the birth rate declines much further and no increase in immigration is permitted, the natural increase of the rural population will not be enough to prevent a decline in the urban population, nor in the total population of the nation. Young people who move to the cities must realize the grave danger that their families will die out.

WHAT CAN YOU DO?

1. Locate on good land.

2. Have enough land, rent it if necessary.

3. Think carefully about investments.

Many a farmer has lost his farm mainly because he borrowed too much money at a time when the outlook was

good without allowing for the effect of lower prices for farm products on his ability to repay his debts.

In general, invest in the things you know most about, and do not be in a hurry. Be careful about going into debt.

At such a time as this prediction is particularly hazardous, but I venture these predictions with confidence. Agriculture will survive; good farming will continue to pay better than poor farming; good land will continue to be better than poor land; a good farmer on good land, and enough of it, is likely to make a better living than he would make in a city.

The farmers have done more in saving waste during the last ten years than the factories have. But the real problem is, we have not been distributing it well. That is what I hold our Government partly responsible for. It has not realized the policies it has been pursuing result in a concentration rather than a distribution of wealth.

Club members and leaders told of their successful club experiences. Several reported the work being done by older club members, organized partly to help younger club members, and partly for self-improvement through study and demonstration.

The following suggestions were given for these older groups to consider for their program:

1. Read more books instead of so many magazines and papers. 2. Study the national trend, both the production and consumption end. 3. Public speaking. 4. Family recreation. 5. Relative importance of clothes. (Not so important as we think.) 6. Dairy and poultry production. (Danger of over-production.) 7. Vocational guidance. 8. Principles of home making for boys as well as girls.

One older club girl spoke pertinently when she said, "We are trying to adjust ourselves to present conditions. We try to do without things cheerfully."

Dr. Baker questioned the young people as to what they are reading. One boy had raised the point of the need for ability to speak in public. "Your thoughts must first be stimulated by what you read." A few read the Government bulletins—most of the group read the farm magazines and papers.

It was agreed that Government and State bulletins are too hard to read, not only because of technical phraseology, but also because the print is too fine and columns too wide.

A FEW SIGNIFICANT STATEMENTS

Mylo S. Downey, Allegany County—"What we recommend to farm youth depends on their capabilities and home conditions. We encourage them to develop something that will give them an income in addition to the general farm income; their own poultry flock is an example."

Miss Dorothy Hinder, Baltimore County—"Most of the 4-H Club girls wouldn't leave the farm for the world. I think they love not only farm life, but the farm family life. And they are trying to improve conditions."

Miss Helen Witter, Frederick County—"I don't think we are exactly satisfied with conditions, but we are making the best of them and looking forward to sounder conditions in five or ten years."

C. Robert Keller, Frederick County—"I couldn't think of anything better than life on the farm and farm work. I like it. Of course, we would like to have the work lightened a bit. I don't worry about it, but it is hard on Dad and Mother. They keep telling me not to be a farmer, but to hunt for something different. The farmer has been more independent in the past, but he is still independent."

George Clendaniel, Harford County—"The 4-H Clubs are dealing with the upper strata. How about the folks who don't own their farms? The farm labor situation has at least reached a point where we have a surplus. The same

thing is true of industry. What can we offer these young folks to carry them over these times? I see no relief in sight at present. I hope to get some information along that line.

"While as has been said, a certain percentage of the young folks are satisfied with the farm, I don't think we can encourage that to extremes, because a certain group will not be satisfied with farm life because their talents may run differently. There is a group that is going out and should go out.

"I don't think we can make a blanket recommendation that they stay on the farm."

Pascal Renn, Frederick County—"Encouraging every one to stay on the farm is detrimental because some may wish to be physicians and lawyers and would be slovenly farmers at best and make farm conditions worse. Farming should be done only by those who are really interested in the work. The trouble is, they feel they cannot make as much on the farm as those working in the cities. I read an article some time ago comparing city and farm incomes. Medicine, law, and engineering were listed starting with $5,200 down to $650 for the farmer. Even unskilled labor was getting $945. When the farm boy looks at those figures they naturally make him dissatisfied. I think only those interested should stay on the farm, and the others go to the city."

Louis Merryman, Baltimore County—"The soundest rural type we have since the war is the Pennsylvania Dutch. In Minnesota and some other places we have the same type of family life. They think it almost a sin to spend actual money for labor. The women work as hard as the men. It is a partnership arrangement. They usually have comparatively small farms, around 50 to 60 acres, and work them intensively, and take care of the land. They are more or less self-sustaining."

Mrs. Grace W. Royall, Montgomery County—"We have a monthly conference for leaders and home demonstration

agents meet with us and we discuss our problems there. We bring our sandwiches for supper so we will have more time. It has been of great help to us. I hardly think we could carry on our little clubs without it. We compare notes, get ideas and discuss how we can carry on our clubs."

Miss Helen Schellinger, Kent County—"The high school girls help a great deal with the smaller girls in their clubs. We get supper, eat it together, and then talk about the things the girls are interested in, their poultry clubs, the things the girls do that they shouldn't do, and why they do them. Then we have a conference in the form of a business meeting, and half the group conducts the meeting while the other half takes notes."

Willis Cissel, Howard County—"Our Alumni 4-H Club is mostly composed of older club members, anyone who is interested in club work or country life, not necessarily farm life, but rural life, and in better communities in which to live. We do the best we can. We are coming around to a little project work on a larger scale than before. We have a membership of about 36, I think. We do all our work through committees to give us more time for discussion in the meetings. We had one meeting on 'What is Produced in Howard County.' We are working on a literary branch. We want to have more books and magazines put into the homes."

John Stiles, Montgomery County—"At present the older girls and boys are organizing a Federation. It will be a great help to Montgomery County, because the boys and girls didn't work together before. A program for each month has been formed, and we give everybody a part to work out in that program. Some of them know a year ahead of time."

Mr. Downey—"We have another organization which we call the Junior Extension Club, made up largely of older 4-H Club members and people who were not club members. We have found it advisable to have people who were not

always 4-H Club members in that club. We have found that people will join it and then later organize small 4-H Clubs. Of course, that organization discusses things which members are interested in that are not discussed at regular club meetings. They have already arranged a program for this year. They discuss how taxes are assessed, etc. That is made up of people 18 years of age and up."

Mr. Renn—"I think one of the things to discuss now is how to get more farm boys in the meetings to get up on their feet and express their own ideas. We need more leaders on the farms, fellows to take an interest in the farm. In our county we discuss such things as reducing taxes. We have asked several big men to talk to us on that, but they said they didn't have time. So it falls back on the farmers themselves, if they want any relief. So many of the boys are afraid to get up and talk because they think they might make some grammatical error. I think we ought to develop that more, teaching them to get up and express themselves, and it is up to the 4-H Clubs to do that."

Lee Howes, Montgomery County—"The Jersey Calf Club has practically run the county breeders' association. All the officers were taken from the old calf club members of the county. During the coming year we want to take up the problems of farm boys and try to solve them."

REPORT

OF THE

Roadside Marketing Conference

January 4, 1933

BALTIMORE, MARYLAND

S. B. SHAW, Acting Secretary

Knowing of the efforts which have been put forth by certain farmers in other States in the development of the roadside marketing business, and believing that similar activities might be undertaken in Maryland, several farmers who had been successfully operating such markets for a number of years expressed a desire to hold a conference with those engaged in this business for the purpose of developing an organization which would enable them to carry on their business more advantageously.

In response to this request and in conjunction with the annual meeting of the Maryland Agricultural Society-Maryland Farm Bureau Federation, held in Baltimore the week of January 4, Dr. T. B. Symons, director of Extension Service, invited a number of roadside market operators to attend a conference on January 4.

About forty farmers attended and Dr. Symons pointed out the opportunities which existed in Maryland for the further development of roadside markets. He also called attention to what was being done in Pennsylvania, Massachusetts and other New England States in helping bring the farmers and consumers closer together for the mutual benefit of both parties.

Dr. S. H. DeVault, head of the Department of Agricultural Economics, University of Maryland, presented the

results of a recent survey which had been made by his department in conjunction with Maryland roadside markets. He called attention to the chief problems and difficulties encountered in the State and presented the possibilities for improvement in this undertaking.

Miss Caroline Sherman, economist of the Federal Bureau of Agricultural Economics, reported on what other States are doing in organizing roadside farm markets.

S. B. Shaw, representing the State Department of Markets, advised how this agency could assist in such an undertaking.

Mr. Miles H. Fairbank, secretary of the State Farm Bureau, offered the assistance of that organization in helping develop the project.

On behalf of the farmers who are operating these markets the following persons discussed various angles of roadside marketing, and from their individual experience offered some very valuable suggestions:

E. W. Bartol, Finksburg; Mrs. Howard Mann, Ellicott City; A. H. Nofsinger, Cockeysville; Mrs. Louis Merryman, Sparks; Granville Hibberd, Brooklandville; George Deitz, Fallston; W. H. Young, Glenburnie.

After the subject had been thoroughly discussed from many angles, a motion was made that the conference appoint a committee to consider the organization of roadside market owners. This motion was unanimously carried and a committee consisting of the following was appointed:

A. H. Nofsinger, chairman; E. W. Bartol, Mr. and Mrs. Howard Mann, Wilbur Stevenson, Granville Hibberd, W. H. Young, George Deitz, S. B. Shaw.

The chairman of this committee called the members together at 2 P. M. the same day, at which time the subject was thoroughly discussed. Upon motion duly made and seconded it was unanimously decided to form an organiza-

tion to be known as the *Maryland Farm Roadside Market Association.*

The committee requested the State Department of Markets to prepare a constitution and by-laws, and a form of lease to be used in connection with a sign to be adopted as the official emblem of the Association; also to prepare a sign of this character. This material was to be presented at a general meeting of roadside market operators called for February 13 at the Lord Baltimore Hotel.

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